British Submarine Development and Policy 1918 - 1939.

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S E C T I O N B

P O L I C Y

CHAPTER 7

1918 - 1922

VERSAILLES & WASHINGTON CONFERENCES

The close of the First World War found the Royal Navy stronger than at any time in its history but the British Government, influenced by the need to rebuild the national economy, favoured disposal of as much of the burden of armaments as appeared practical. 'Normalcy' would mean something a long way below the levels of 1913 or 1914. The Royal Navy with global responsibilities and a tradition of being the front line of the nation's defence was aware of the need to preserve a strong fabric of defence capabilities. Although Walter Long,[1] the First Lord of the Admiralty, stated in Parliament that, 'the naval policies of all past governments, whichever party they have represented, have at least included the principle that our Navy should not be inferior in strength to the Navy of any other power, and to this principle the present Government firmly adheres,'[2] this was clearly a less firmly stated commitment than earlier claims to a pre-eminent position had been. A result of this policy was the danger of either dividing naval forces to cover potential threats in Home Waters and the Far East or running the risk of a crisis arising in one area while the Fleet was in the other area.

The defeat of Germany had removed Britain's major naval rival but the post-war world revealed the emergence of America and Japan as major naval Powers. Both countries had massive naval building programmes under

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1. Long, W.H. (1854-1926); b. 13 July 1854; First Lord of the Admiralty, 16 Jan. 1919 - 18 Feb. 1921; Viscount Long of Wroxell, 1921; d. 26 Sept. 1926.

2. Parl. Debs., 5th ser., H.C., Vol. 2b, 17 Mar. 1920, Col. 2301.

consideration and their respective political and commercial ambitions seemed bound to challenge Britain's traditional maritime position. In the past, the British Government had responded to any such challenge by building ship for ship. Financial resources now precluded such a course of action and the answer was sought in a series of Anglo-American meetings, culminating in the Washington Naval Conference of 1921-22, to achieve an equality based on reduction of naval forces. However, American acceptance of British naval disarmament proposals became dependent on a replacement of the Anglo-Japanese Alliance by an agreement more acceptable to the United States. The problems presented to the Admiralty of producing such a formula, while providing adequate naval protection for British interests in the Far East were to be crucial because of the diminishing strength of the Royal Navy. It was this growing belief that any future naval threat lay in the Far East, coupled with the decision that military planning was to be on the basis that Britain was not expected to be involved in a major war for ten years, that was to dominate naval planning during the 1920's.

British submarine policy was not only subordinated to such factors but in addition the wartime successes of the German U-boats influenced successive British Governments to press for the total abolition of the submarine. Gradual recognition of the impracticality of securing acceptance for this policy led towards other proposals to limit the power of the submarine by means of size, numbers and use. Operationally, by 1918, British submarines had proved to be a failure in the defensive role, since none of the German naval raids against the East coast of England had been intercepted, despite the large number of coastal submarines allocated for such a purpose. However, the overseas patrol submarines had proved their capability to operate unsupported in enemy waters where surface warships could not venture. With the advent of peace the submarine appeared to

have secured a firm place in the Royal Navy. Nevertheless, there was a reluctance to develop a weapon which in the hands of an enemy was a grave threat to Britain's naval position and national survival. The submarine, although it had not disposed of a modern capital ship, had placed restrictions on the movements of surface warships and influenced the decisions of Fleet Commanders to an extent out of all proportion to its cost. The need for destroyer escorts was an admission that the battleship's traditional freedom of manoeuvre had been severely restricted. The result was that the immediate post-war years saw the decline of the Royal Navy's submarine strength to approximately one-third of its wartime size.

The factors affecting this reduction were initially related to the surrender of the German submarine fleet and the attempts to secure international agreement on the abolition of the submarine. In order to achieve this the British Government were prepared to consign the entire British submarine force to the breakers' yards. However, the Admiralty recognised that if the attempts to secure abolition failed then it would be necessary to continue submarine development and this would be easier if a nucleus were retained pending a decision on abolition by the other major naval Powers. The surrender of the German submarine fleet was considered a prime necessity in 1918-19 because of the immense strain which had been placed on the material and manpower resources of the Royal Navy by the unrestricted submarine warfare campaigns. Moreover, although it was accepted that the U-boats had been checked it was equally clear that they had not been defeated, a point which the First Lord, Sir Eric Geddes[5] accepted in stating that another unrestricted submarine campaign by Germany, 'would undoubtedly occasion great loss of life and property to

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5. Geddes, Sir Eric C. (1875-1937); b. 26 Sept. 1875; First Lord of the Admiralty, 20 July 1917 - 16 Jan. 1919; d. 22 June 1937.

the Allied and Associated Powers.'[4] In hindsight it is clear that the powers credited to the submarine at that stage of its development were exaggerated but still rested on much firmer ground than the images conjured up prior to 1914 by senior naval figures such as Admiral Fisher. Certainly, despite the success of the British submarine forces, the attitude of the Admiralty was that Britain stood to benefit more from the abolition of the submarine than from its retention. Opposition was expected from the French and Italians who regarded the submarine as a relatively cheap means of naval defence. However, the conclusion was that even if limitation was the best solution which could be achieved it would still be 'possible to reduce the number of officers and men in this particular service.'[5] There would then be at least a financial saving and it was this theme, coupled to the awareness of the destructive power of the submarine in the hands of an enemy, which dominated the attitude of the British Government and Admiralty to the submarine in the inter-war period. Even if A/S devices could be developed to a level ensuring dominance over the submarine in any future maritime conflict it was accepted that large numbers of destroyer and escort vessels would still be required. Such numbers could not be produced quickly and this necessitated maintaining a large destroyer force in peacetime, far in excess of existing requirements for other purposes. In a period of financial retrenchment this policy was extremely unattractive and lent impetus to the decision to seek abolition. Moreover, in later years the motivation to prepare adequate numbers of A/S vessels was to become submerged under political and financial pressure to provide only those warships necessary to meet the minimum peacetime requirements.

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4. Geddes to Allied Naval Council, Nov. 1918, ADM 1/8542/290, 'Appendix D.'

5. First Sea Lord, Admiral Sir David Beatty, 6 Feb. 1919, ADM 1/8549/18, 279/H.F.0010.

Meanwhile, post-war re-organisation of the warships and dispositions of the Royal Navy led to a major reduction in the number of submarines. Early in 1919 the remaining submarine flotillas were allocated; four to the newly created Atlantic Fleet, one to the Mediterranean Fleet and one to the China Station.[6] Throughout the inter-war period, the policy was maintained of stationing a strong submarine force on the China Station. This gradually evolved into the strategic concept of a holding force, in the event of conflict with Japan, until the main Fleet could arrive from European waters. Due to the vast area of the Pacific the policy was always to allocate the largest patrol submarines available. However, these boats were usually inadequate in size and endurance for the roles assigned to them. Initially, this was due to the restrictions placed on submarine development in the immediate post-war years when the hopes for abolition were strong. However, even in later years restrictions on resources and the effects of disarmament treaties on numbers and tonnage of submarines ensured that a design large enough and sufficiently specialised for the Pacific area alone could not be developed.

Further restrictions on development were created by the introduction of the 'Ten Year Rule', approved by the Cabinet on 15 August 1919.[7] Under this rule it was accepted for planning purposes that the British Empire would not be engaged in a major war for at least ten years. In the

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6. Admiralty Operations Committee, 14 July 1919, ADM 1/8564/210.
   See also: Beatty, 8 July 1920, ADM 1/8602/54.

7. S. Roskill, 'The Ten Year Rule - The Historical Facts,' Royal United Services Insitute (R.U.S.I.) Journal, 117 (1972), 69-71.
   See also: P. Silverman, 'The Ten Year Rule,' R.U.S.I. Journal, 116 (1972), 42-45.
   and also: K. Booth, 'The Ten Year Rule - An Unfinished Debate,' R.U.S.I. Journal, 116 (1971), 58-63.

absence of the First Lord and First Sea Lord the Board of Admiralty laid down,[8] on the submarine category, that within the framework of at least maintaining an equal number of ships to the United States Navy, 'the number of submarines in commission is largely reduced, and the principle of placing these vessels in Reserve accepted for the first time,' and with particular reference to the submarine, 'the prospect of ten years peace was especially borne in mind.'[9] The propounding of this policy followed the British failure to secure international agreement on abolition and the acceptance that the submarine would continue in military existence for at least the immediate future.

Evolution of the British Position on Submarine Abolition at Versailles

Only eight months before the Versailles Conference the prospects for abolition had appeared good. On the eve of the Armistice lengthy discussions had been initiated for planning British tactics at the forthcoming Peace Conference. In physical and economic terms, Britain had suffered far more damage than all the Allies and Neutrals, from the U-boat campaigns of 1917-18. Defeat had appeared sufficiently close at one point to ensure the belief that the abolition of the submarine was necessary and that,

> 'the condition which would most surely guard our naval security in the future would be the surrender of the whole of Germany's submarine fleet and an international agreement that no power was to build that class of vessel in the future.' Even then the question of an international agreement was qualified. 'The latter condition, however, is only practical if a League of Nations is formed with the power and will to enforce such rules.'[10]

An additional factor was the smaller cost of producing a submarine rather than a capital ship. Undoubtedly, Britain's vast investment in the latter

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8. Board Minute No. 924, June 1919, ADM 167/56.

9. Naval Staff, Feb. 1919, ADM 1/8549/18, 'Post-War Fleet.'

10. Naval Staff, 10 Nov. 1918, ADM 116/1861, 'Discussion of Draft Terms of Peace with Germany.'

vessel contributed to her perceived vulnerability to the submarine, even if only by reducing the resources available for the extra A/S vessels needed. The natural conclusion was, 'that the submarine is essentially the weapon of the weaker naval power and that ... the subject of universally forbidding the construction of submarines in the future ... would undoubtedly be in the interests of Great Britain.'[11]

These matters were further discussed at a full Board meeting on 14 November, when initial recommendations for the naval aspects of the Peace Treaty were adopted. The demand for the surrender of the German submarine fleet was confirmed and there was strong support for, 'a universal interdict on submarine construction if the idea of an all powerful League of Nations materialises.'[12] This was a firm 'hedging' of the options on a final decision and a realistic acceptance that the chances of Britain, alone, persuading other nations to agree to prohibition of submarine construction was unlikely. In particular, the French attitude was expected to become intractable. The First Sea Lord Admiral Wemyss[13] also sounded a note of caution; he was dubious about the League of Nations ever being established. Even if such a body were created it was considered unlikely that it would consist of more than the Entente Powers and their Allies. Such limited membership would restrict the organisation's powers. Further, despite this Britain would, 'almost certainly be in a minority in matters

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11. Ibid.

12. Admiralty, 14 Nov. 1918, ADM 116/1852, 'Board Meeting for Discussion on Peace Settlement, Section 3(c): Admiralty Policy in Relation to the Peace Settlement.'

13. Wemyss, Rosslyn Erskine, Baron Wester Wemyss (1864-1933), Admiral of the Fleet; b. 12 Apr. 1864; First Sea Lord, Dec. 1917 - 1 Nov. 1919; ret. 1929; d. 24 May 1933.

affecting sea-power,'[14] and this included the question of submarine abolition.

Board feelings on abolition were not unanimous and some favoured proposing not only total abolition but also not accepting any compromise suggestions on restricting the operational use of the submarine. The proposal was that policy should be directed towards an agreement that, 'all nations, including neutrals ... agree not to build submarines or submersible for any purpose, commercial or otherwise,' as, 'this,' was, 'the only way to deal with the matter, no agreement as to use of submarines,' being, 'of the slightest value.'[15] Various alternative suggestions were put forward for use in the event of failure. These included limitation of submarine size, restricting this weapon to defence of coasts and ports by reducing the operational radius. However, this idea was considered impractical.[16] Nevertheless, this was an argument that was to be resurrected during the disarmament conferences of the inter-war period. Although a submarine of 'coastal' tonnage might not have the endurance to operate in mid-ocean this was irrelevant to the threat to those British trade routes which had their confluence in European waters.

The question of whether and how to place legal restrictions on the use of submarines in war came under the jurisdiction of the Admiralty Reconstruction Committee. Their general conclusion was that,

> 'a Submarine could only be a legitimate weapon against commerce provided that it conforms to

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14. Wemyss, 1919, ADM 116/1852, 'Terms of Peace - Preparation of the Naval Requirements of Great Britain.'

15. Second Sea Lord, Admiral Sir Hubert L. Heath, 1919, ADM 116/1852, 'Peace Terms - Conditions to be Aimed at.'

16. D. of P., 1919, ADM 116/1852, 'Notes on Matters Affecting Naval Interests Connected with the Peace Settlement, Section IV: Future Peace and League of Nations - Prohibition of Submarine Construction,' 35.

> 'the laws of naval warfare, namely, attempts to visit and search merchantmen before capture, and in case of capture places in safety all persons on board and removes the relevant papers before destroying the prize. In the present stage of its development it does not conform to these requirements.' This was precisely the reason the Committee wished the restrictions to be so framed. 'Every effort should be made to ensure the reiteration of the rule requiring visit or summons to surrender before any attack is launched against a merchant ship.'[17]

It is difficult to accept that the Committee were prepared to believe that a submarine would sacrifice its major advantage of surprise and that a State would adhere to this restrictive ruling if it were facing defeat. Moreover, although the Admiralty's official view was taken to be in favour of total abolition the Committee, 'considered that it was extremely improbable that other nations would agree to this.'[18]

On the use of mines against submarines, which had been successful when they were laid in 'barrier' fields such as the Dover Barrage, the Committee adopted a practical attitude and proposed no change in the existing international law. This was because it was clearly to Britain's advantage to possess a relatively successful and cheap A/S weapon. When it was pointed out that if the submarine were abolished then Britain would lose a major reason for retaining the mine, it was quickly emphasised that no agreement to abolish the mine was likely as all nations considered it a quick and simple weapon to produce.[19] The final assessment was that, 'as mines, controlled and uncontrolled, at present constitute one of the principal

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17. Admiralty Reconstruction Committee, 1919, ADM 116/1852, Section V, International Law, 37.

18. Ibid.

19. Admiral Heath to Admiralty Reconstruction Committee, 14 Dec. 1918, ADM 1/8546/329, 'Question of International Law - Mines.'

'means of combatting Submarines, it is essential that until some equally efficient method is devised we should retain their use.'[20]

On the specific issue of abolition, Admiral Beatty favoured a vigorous attitude whatever the apparent difficulties and foreign opposition.

> 'The submarine, commercially, is of no use to the nations of the world. It has been demonstrated that its use in war tends to outrage the laws of civilization and humanity when in the hands of a weaker power, and there exists a temptation to attack commeree. It is considered that Great Britain should take a definite standpoint in the Peace Conference that submarine warfare should be abolished and the building of submarines by any nation should be definitely prohibited by International Law and the League of Nations.'[21]

This view was adhered to by the Board who accepted the recommendation that, 'there should be a universal prohibition against building submarines ... under the guarantee of an inspecting commission having the right and power to enforce the decrees of a League of Nations.'[22] However, a body of opinion on the Board, led by the Third Sea Lord, Admiral de Bartolomé, favoured rejecting the policy of total prohibition. In a closely reasoned memorandum he advanced several arguments in favour of a more realistic and flexible policy. Admiralty policy, he pointed out, had been to emphasise the submarine as the weapon of the weaker Power. Therefore, it was natural to assume that at the Peace Conference these smaller naval Powers would oppose any proposal by the British to abolish submarines. 'By making such a proposal we, the stronger power, should merely show our fear of this weapon and of its tendency to nullify our huge, and at present,

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20. Ibid.

21. Beatty, 13 Dec. 1918, ADM 116/2150, 5232/H.F.0051, 'Proposals as Regards Terms of Peace with Germany.'

22. Admiralty Reconstruction Committee, Jan. 1919, ADM 116/2150.

'predominately surface fleet.'[23] Moreover, it was unrealistic to ignore the usefulness of the submarine, especially in the reconnaissance role, along with the fact that, 'we have developed submarines more fully than any other nation ... and it would be the height of folly to prevent ourselves advancing naval design in the direction most open to improvement, whilst other may and probably will do so.'[24] Even if an agreement on abolition was achieved it would still be impossible to guarantee to be able to detect the building of submarines and,

> 'no League of Nations employing hosts of inspectors could prevent the design and trial of submarines perhaps only with small scale models in a tank. When the design is complete and the model tested, construction is a simple matter, especially as no form of prohibition can destroy the knowledge of submarines which the world now possesses ... If therefore, a nation were determined to build submarines, there would be no difficulty in preparing parts for erection at any selected locality.' The overall appeal was for a facing of reality since, 'submarines have come to stay, and it is our business as practical people to accept the fact, and to do our best to find a counter to them. This we are doing, and our efforts appear to have been attended with a considerable amount of success ... instead of attempting to prohibit it we should endeavour to improve it, especially in regard to speed underwater. We have the leadership in the design and use of this weapon and should not throw it away.'[25]

However, the majority of the Board still considered that there would be greater advantages to Britain in abolishing rather than retaining the

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23. Admiral Sir Charles Martin de Bartolomé, 1919, ADM 116/1852, Appendix to 'Admiralty Policy in Relation to the Peace Settlement - Proposed to Forbid the Building of Submarines.' (Posts of Controller and 3rd Sea Lord merged Nov. 1918.)

24. Ibid.

25. ADM 116/1852, Bartolomé, 'Admiralty Policy in Relation to the Peace Settlement.' (See Note 23.)

submarine. Therefore, the policy was to be one of no compromise. Moreover, the hope was that the French would withdraw their objections if they were offered advantages on matters affecting land and air forces plus security of frontiers. However, there was an awareness of how flimsy an agreement to any document could be under the strain of war. 'In peacetime, armaments might be cut down and the construction of certain weapons forbidden; but war is by its very nature unlimited, and attempts to handicap one weapon more than another must break down under the stress of war.'[26] Nevertheless, no alteration was made in the policy that:

> 'It would be most desirable, in the interests of this country if the use of the submarine in war was absolutely forbidden,' and, 'an attempt should be made to obtain this.' However, a realistic note was introduced in conclusion: 'There is likely to be strong opposition to this proposal, and it is improbable it will be adopted.'[27]

The French were known to favour retention of the submarine for several reasons, including the belief that it was not the weapon itself which was treacherous but rather the way in which it was used.

At the meeting of the Allied Admirals on 1 May 1919, the French emphasised their view that the suppression of the submarine was only being sought by the wealthier and more powerful nations, whose main reason was protection of their investment in large battlefleets. Much of this attitude could be ascribed to French weakness in capital ships. Nevertheless, the French Government made it clear that any attempt to achieve submarine abolition at Versailles or later conferences would be

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26. Admiralty to Imperial War Cabinet, 1919, ADM 116/1852, 'Freedom of the Seas: The Use of Submarines and Mines in War.'

27. Admiralty Reconstruction Committee, Feb. 1919, ADM 116/1852.

opposed. This opposition was also extended to any moves towards legal restrictions or limitation of numbers.[28] However, the Admiralty did not press the issue strongly in the interests of post-war Allied co-operation.

Nevertheless, the attempt to achieve abolition had proved useful practice for British tactics to be used at future naval disarmament conferences. The immediate result was the production of a policy which accepted the temporary retention of the submarine in the Royal Navy and the newly created 'Ten Year Rule' was invoked to justify retaining an even smaller number of submarines. The Treaty of Versailles, signed on 28 June 1919, did produce one important result in the submarine category, for the Admiralty. Under Article 191 Germany was specifically forbidden to possess or acquire submarines. Although the signing of the Peace Treaty appeared to have ended the threat posed by the existence of a powerful German navy, nevertheless, the problem remained of ensuring that the provisions of the Treaty were not violated. Moreover, if the Germans were to resort to naval rebuilding a serious question mark hung over the resolve of the Allies to use force to prevent this, especially in the face of the war-weary attitude of their populations. This was generally relevant to the question of submarine abolition since the construction and equipping of A/S forces would take far longer than [illegible] an equivalent submarine force. The logical conclusion would be that it was more practical to attempt to curb the existence of the submarine rather than press for total but probably temporary abolition. As Admiral Heath had pointed out, once the world had knowledge of a weapon no practical person could hope to eradicate it. Acceptance of the need to pursue the policy of limitation rather than abolition was gradually to be recognised by the British but before this the policy of eridaction was to be pursued again, this time at Washington.

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28. Admiralty, May 1919, ADM 116/1852, 'Admiralty Policy in Relation to the Peace Settlement,' 4-5.

Meanwhile, Admiral Jellicoe had embarked on a mission to assess the naval requirements of the British Empire. 'The uncertainty about future naval policy which prevailed in Britain left him with little guidance from the Admiralty and obliged him to form his own opinion of the naval strength needed for the Empire as a whole and base his recommendations on this.'[29] Jellicoe assumed that Britain's most obvious enemy would be Japan whose geographical position would require the maintenance of a 100% superiority in capital ships to ensure a superior force in that area. This required Britain to retain a pre-war level of naval forces.

> 'But since Japan's naval expenditure almost tripled between 1917 and 1921 and a further rapid increase of construction was planned for the next six years, Jellicoe's ideal of a fleet double the strength of the Japanese navy in capital ships was a sheer impossibility in,' Britain's, 'post-war economic circumstances.'[30]

Jellicoe also recommended the need for 36 submarines to be acquired by the Dominions, at a time when support for abolition remained strong. He considered that some submarines would be necessary for harbour defence, despite this policy having proved sterile during 1914-18. Most of the submarines would be earmarked for reconnaissance, including detection of Japanese southward naval movements.

> 'These submarines would work from Hong Kong. Four more submarines, also working from Hong Kong, should be employed in watching the northern portion of the China Sea. Four are required in the Torres Straits, and the remaining twelve should be employed in watching off naval bases in Japan, being based on Hong Kong. It is important to keep submarines in Japanese waters, as the moral effect alone of such action would be great.'[31]

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29. A. Temple Patterson (ed.), The Jellicoe Papers, Navy Records Society, (London, 1966-68), II, 266.

30. Temple Patterson, II, 268.

31. Temple Patterson, II, 352.

Decisions on all these dispositions depended on the direction followed by future British naval policy. In the First Lord's opinion the criterion for this was not to allow naval capability to fall below the level where it was unable to meet the obligations undertaken by the Government. However, the solution was complicated by the fact that the economic condition of the country precluded the maintenance of naval expenditure at anything like a wartime level. Moreover, the Government did not consider that the international situation justified incurring such costs and were more concerned as to how much could be saved by immediate economies. The Admiralty considered that it was too late for any financial reductions to affect the 1920 Navy Estimates but, 'for 1920/21 the case was quite different, and we are endeavouring to make a programme which will reduce the Navy to at least something like pre-war conditions, and so materially lessen the cost to the country.'[32] A note of caution was sounded on the question of reducing the naval forces primarily to fit the post-war economic environment.

> 'It is easy to fall into the error of allowing the urgent need for retrenchment to outweigh the really essential services and requirements ... But until ... measures are actually in existence, until they are subscribed to by all the Great Powers, we cannot afford to renounce our naval position.'[33]

The policy of retrenchment threatened the Submarine Service on two levels. These included the reduction of existing numbers and the scarcity of resources for new construction. Overshadowing these factors were the constant policies designed to achieve international agreement on abolition or limitation of the submarine. Despite the decline in submarine numbers

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32. First Lord, W.H. Long to Cabinet, 1919, ADM 116/1677.

33. Board of Admiralty to Cabinet, 1919, ADM 116/1677.

there was strong public support, in the early post-war years, for the submarine as the major warship of the future. This entailed the removal of the capital ship from this position, 'on the grounds that they have been rendered obsolete by submarines and aircraft.'[34] Against this was a strong body of naval opinion which continued to regard the capital ship as the final arbiter of naval warfare. For several months there was an intensive public debate among most of the prominent naval, military and political figures not barred from comment by the holding of active commissions or public office. The Conservatives posed some good arguments, especially that the gun remained a weapon of greater range and accuracy than the torpedo or the bomb. Severe disagreement developed over the contention that by building bigger ships and providing underwater bulges as well as increasing horizontal armour to withstand bombs, the battleship could be made invulnerable to attack by submarines and aircraft. Aircraft carriers and their aeroplanes were considered not to be the future major naval strike force but rather as essential auxiliaries to the battlefleet. The resulting roles included reconnaissance, gunnering spotting and torpedo attack against a retreating enemy fleet, although only with the limited object of slowing vessels down rather than to achieve a decisive result. The Admiralty considered that, 'it has been proved conclusively that the unseen pressure of the British Fleet, the main strength of which lay in the battleships, contributed in no small measure to the collapse of the Central Powers.'[35] Opinion, in general, tended to adopt a sceptical attitude to this claim and many felt to the contrary, that,

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34. Board of Admiralty, 1919, ADM 116/1677, 'The Retention of the Capital Ship.'

35. Ibid.

> 'because a decisive victory over the High Seas Fleet would have shortened the war, greater risks should have been taken with the Grand Fleet.' However, 'such a policy never commended itself either to the Admiralty or to the C. in C. Grand Fleet. The submarine and mine threats had a cramping influence on Grand Fleet strategy, the former by generally restricting the operations of the battle fleet to open waters in the northern half of the North Sea ...' and by forcing the capital ships and cruisers to proceed to sea screened by a host of destroyers ... There were times when some of the big ships were left behind rather than take the battlefleet to sea without full destroyer protection.'[36]

The Admiralty held stronger ground in the assessment that, 'the country whose fast capital ships and their complementary Units are not contained or held by similar enemy ships can, with these vessels, sweep the enemy ships and sea-borne trade off the seas.'[37] Nor was there any blindness to future matériel developments. 'It goes without saying that the great march of science, and the increasing potentiality of submarine and aircraft, will exert a profound effect upon the design of larger vessels of war and may even cause their eventual disappearance.'[38] However it was not considered that the demise of the capital ship was imminent. Nevertheless, pressure was so intense that the 1920-21 Navy Estimates included the unprecedented move of adding the views of the Naval Staff on this issue. Admiralty support for the capital ship was firmly outlined. 'There has been some criticism of the present types of vessels, especially in regard to the capital ship ... The Naval Staff has examined this question with extreme care and as a result we profoundly dissent from these

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36. A.J. Marder, From the Dreadnought to Scapa Flow (London, 1961-70), V, 300-301.

37. ADM 116/1677, Admiralty to Cabinet. (See Note 33.)

38. C. in C. Atlantic Fleet, Admiral Sir Charles Madden to Admiralty, 10 June 1921, ADM 1/8597/9, 'The Capital Ship v Submarine and Aircraft.'

'views. In our opinion the capital ship remains the unit on which sea-power is built up.'[59] The natural result of accepting the capital ship as the arbiter of naval warfare was the preoccupation of tactical exercises with the massed Fleet action. However, despite the belief in the capital ship there was general agreement that as long as the submarine existed there would be a need for destroyer flotillas to protect the capital ships.

Meanwhile as a result of the Cabinet's endorsement of the 'Ten Year Rule' on 15 August 1919 the Royal Navy was to be allocated not more than £60 million under the 1920-21 Navy Estimates. The Admiralty considered this an unrealistic amount. Even by pruning the Fleet to the minimum they considered necessary for Imperial defence, current costs could not be reduced below £58 million and this figure included no provision for new construction.[40] There was the added problem of a ~~possible~~ probable naval building race with the United States which would be financially prohibitive for Britain. The former possessed the economic power to outbuild Britain in all categories of warships, although there was no threat of war between the two nations. Nevertheless, it was considered that if Britain relinquished her traditional naval pre-eminence, it would have a profound effect upon the nation's international prestige, authority, and commercial advantages.

Beatty pointed out to the Cabinet that,

> 'if an understanding with the United States was not possible then it would be necessary definitely to lay down that a "One-Power Standard" against the strongest naval power is the minimum standard ... and that the British building programme in all types of vessels must be such that this "One-Power Standard" is fully maintained.'[41]

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39. Long, 17 Mar. 1920, ADM 116/1617, 'Statement to Parliament on the Navy Estimates, 1920-21.'

40. See Appendix: G(1).

41. Beatty to Long, 18 July 1920, ADM 1/8602/54, 'Necessity of Avoiding a Supplementary Estimate in 1921-22.'

The situation was now considered to be at a crucial stage and the utmost importance attached to achieving an understanding with the United States. 'No modification of the United States 1916 Programme has occurred, and to carry out the Government policy and maintain a "One-Power Standard", the commencement of a building programme in the financial year 1920/21 will be essential.'[42] However, a building race in the submarine category was considered unlikely since:

> 'Important developments in regard to the internal combustion engine and other factors may be expected during the course of the next year, and prior to full consideration of these developments, it would be unwise to embark on a programme of Submarine replacement and construction. The argument of gradual replacement in the case of Capital Ships does not apply to Submarines, which are rapidly and comparatively cheaply built, and it is an advantage, therefore, with Submarines to wait and gain the result of laboratory and sea trials now being carried out.'[43]

Overall, the policy proposed was for: 'An alliance or Entente with the United States based on equality in Naval Matériel.'[44] However, it was necessary not to give the impression that the withdrawal from the 'Two-Power Standard' was being forced on the Admiralty by economic pressures and alterations in the international situation.

> 'I should propose to say that the Naval Policies of all past Governments, whichever party they represented, have at least included this principle that our Navy should not be inferior in strength to the Navy of any other Power, and that the present Government adheres to this principle; that we are fortunate now in that the only Navy approximating in strength to our own is that of the U.S.A., with whom we are associated in such a way that the idea

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42. Beatty to Long, 13 Feb. 1920, ADM 1/8602/54, 'Naval Estimates and Naval Policy.'

43. ADM 1/8602/54, 'Necessity of Avoiding a Supplementary Estimate in 1921-22.' (See Note 41.)

44. Beatty, 7 Jan. 1920, ADM 116/1677, 'Naval Policy.'

> 'of competition is repugnant to us all; and that we hope and believe that if there is any emulation between us it is likely to be in the direction of reducing that ample margin of naval strength which we each alike possess over all other navies.'[45]

Over the next months discussions were undertaken between the British and American Governments with the ultimate aim of working towards a conference on naval arms limitation.

Washington Naval Conference, 1921-22: Preparation of Positions

The United States Government primarily favoured discussion of a building 'holiday' on capital ships, a view accepted by the British Government and Admiralty, although to a lesser degree. Among 'auxiliary' subjects to be discussed, the Admiralty saw the possibility to raise the issue of submarine abolition once again. This was tempered by an awareness of the continued opposition of other naval Powers to such a measure and it was accepted that attempts at 'coercion' would prove useless.

Decision to Press for Abolition - Effects of Failure to Perfect Asdic

British opposition to retention of the submarine by other Powers was partly based on the inability to provide an adequate counter-force. The pressure to develop a means of nullifying the submarine was intensified by dependence on maritime trade and imports. The major effort was directed towards development of A/S devices, principally Asdic. This system had been developed initially by a committee of Allied scientists during 1917-18 and the name given to the device was based on the initials of the committee's title - the Allied Submarine Detection Investigation Committee. The device worked on the principle of projecting a sound wave through the water. This possessed the property of producing an echo when it struck any object in its path. The speed of sound in water being known, a

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45. Long, Jan. 1920, ADM 1/8602/54, 'Naval Policy.'

measurement of the time interval which had elapsed between the transmission and the echo gave the range of the object. The sound wave being undirectional and confined to a comparatively small axis, meant that the direction of the beam gave the bearing of the object. The method of using the device was to sweep the surrounding sea with the sound wave beam. The 'cone' of the signal could be swept through 360°, while a second cone gave a wider search area and once a submarine was located the two narrow 'cones' enabled a more accurate 'fix' to be arrived at. However, this was still an ideal in 1921 and the effects of the sea condition, changes and water temperature and similar factors combined to hamper developments to increase the efficiency of the device.

Development was also restricted by the difficulty of providing adequate numbers of A/S vessels for trials and testing.

> 'On every occasion I have impressed upon Captain A/S the desirability of getting a unit at work with the Fleet flotillas, but up to the present he cannot hold out any immediate hope of being able to undertake this. Stress has also been laid on the importance of arriving at some form of attacking exercise on a Submarine submerged in which some conclusion can be arrived at as to the efficiency or otherwise of the attack.'[46]

After nearly five years of development of Asdic this was a blow to the hopes that the submarine could now be mastered. Moreover, a more optimistic view was not unanimously held in scientific circles, which could explain some of the more extreme efforts to secure an agreement on abolition at the Washington Conference. No attempt was made to gloss over the fact,

> 'that the stage of development at present reached with anti-submarine detection devices would not justify any drastic revision in submarine policy.'

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46. Rear-Admiral (S), D.L. Dent to Admiralty, 5 Aug. 1921, ADM 1/8609/138.

> Further: 'A sufficiently advanced stage of development has not yet been reached for fitting out an Anti-Submarine unit for work with the Fleet, and if such were attempted at the present time it is feared that the development would be retarded rather than advanced.'[47]

This reinforced an earlier report which emphasised that,

> 'indifferent weather and poor results go to show that at present too much cannot be expected of the Asdic gear as now fitted. Rolling defeats it, and the uncertain motion in a seaway causes so many minor troubles in the present design of instruments that reliable results cannot be expected in weather worse than "moderate", however good the results obtained in fine weather may be.'[48]

The Admiralty's comment was pessimistic: 'Destruction cannot yet be guaranteed until greater accuracy in the final stage of the attack is attainable and the weapon of destruction perfected.'[49] The overall position on providing a successful counter to the submarine not only appeared weak but was not improved by the belief within the Submarine Service that whatever improvements were made in A/S devices, the submarine had a future. 'When an A/S unit is ready to join the Fleet ... Submarines will automatically modify their tactics to meet the new conditions.'[50] It was conceded that: 'No doubt submarines will be able to modify their tactics in such a way as to render them less vulnerable to detection and attack.'[51] Nevertheless, the Admiralty preferred to support both the belief that the next five years would see the complete development of Asdic and also moves to

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47. D.S.R. to A.C.N.S., Admiral Osmond de B. Brock, June 1921, ADM 1/8609/138.

48. Captain A/S to Admiralty, 9 July 1921, ADM 1/8609/138, 'A/S Flotilla - State and Proceedings.'

49. D. of T.D., 26 July 1921, ADM 1/8609/138, 'Comments on Report of Captain A/S.'

50. ADM 1/8609/138, Dent to Admiralty. (See Note 46.)

51. D.S.R., 8 Sept. 1921, ADM 1/8609/138, 'Comments on R.A.(S)'s Memorandum of 5 Aug.'

achieve abolition. Even if the latter policy was successful it was intended that development of Asdic would continue so as to provide a safeguard if foreign submarine fleets were rebuilt. However, the continued existence and improvement of A/S devices necessitated the provision of expensive and specialised vessels as well as crews in peacetime. Such a force could not be built up quickly in the event of war. Moreover, if abolition was not achieved, other nations were expected to concentrate on improving the capabilities of the submarine.

Washington Naval Conference: 11 Nov. 1921 - 6 Feb. 1922

The strong British delegation was lead by the Lord President of the Council, A. J. Balfour and the Naval Mission initially included the First Sea Lord, Admiral Beatty, and the First Lord A. H. Lee.[52] At the opening Plenary Session it was the United States delegation which took the initiative by presenting proposals on capital ship limitation and also on quantitative limitation of submarine tonnage. In the latter category, the British Empire and the United States were to be allowed 90,000 tons each, Japan, 54,000 tons; and France and Italy proportionately lower totals. These proposals were received unenthusiastically by the British delegation and they made their position clear on the submarine question. Admiral Beatty not only pressed for a greater reduction in submarine tonnage but also emphasised that, 'he would welcome total abolition of submarines provided that all nations agreed.'[53] This condition was already opposed by many of the smaller naval Powers, who were not represented at the Conference, as well as by France. Shortly after the opening

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52. Lee, Arthur Hamilton, Viscount Lee of Fareham (1868-1947); b. 8 Nov. 1868; First Lord of the Admiralty, 18 Feb 1921 - 31 Oct. 1922; d. 21 July 1947.

53. A.J. Balfour to Marquis Curzon of Kedleston (Foreign Secretary), 14 Nov. 1921, Documents on British Foreign Policy (London, 1966), 1 ser., XIV, 472-73.

Session Beatty and Lee returned to England, leaving naval matters at the Conference in the hands of Rear-Admiral Chatfield. In the absence of both First Lord and First Sea Lord at the Washington Conference, there was a feeling at the Admiralty that the Royal Navy was vulnerable to pressures within Whitehall directed towards further reduction of all three Services. Beatty wrote to his wife on 2 February 1922: 'The question of economy is driving everybody mad, and I believe will leave us in more trouble than all the spendthrift governments we have ever seen ... If it continues we shall have no Navy at all, Washington Conference or not.'[54]

The British considered the submarine to be primarily an anti-commerce weapon;[55] and qualitative limitation of submarines was not considered to be very important in relation to this role. Despite this the question of qualitative limitation was intended as a cardinal issue in any British proposals on submarine restriction if abolition should fail. The contradiction in policy which resulted was highlighted by the reaction in London to a speech at the Conference on 15 November.

> 'I do not know upon whose advice Mr. Balfour gave expression this morning to the position that it might be possible to abolish large submarines as opposed to small vessels of that nature. In many respects it is most regrettable that he should have done so. Firstly, this view implied that a limitation in the size of any particular class of vessel is feasible and is thus opposed to the general policy already approved by the British Government. Secondly, it is entirely a fallacy to suppose that it was the large submarines which did all the damage to British trade in the late war.'[56]

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54. W.S. Chalmers, Life and Letters of David Beatty (London, 1951). (Quoted in B.B. Schofield, British Sea Power (London, 1967), 95.)

55. See Appendix: G(2).

56. D. of P. to Beatty, 19 Nov. 1921, ADM 116/3447, 'Washington Conference 1921-22: Miscellaneous Papers, Note 4, Naval Section.'

The Germans had done most of their commerce destruction with U-boats of 500 tons and Mittel U-boats of 800 tons, while their U-cruisers had proved of little use. British naval opinion was agreed, however, that there should be no qualitative tonnage agreement above the 350 tons figure if only because larger submarines were considered to be better equipped to comply with any 'visit and search' regulations that were agreed to by the Conference. Admiralty planning was also at fault in believing that any nation on the outbreak of war would be short of experienced submarine crews. During the 1930's Admiral Doenitz was to prove that it was possible to build up a reserve cadre of officers and men within a small peace-time fleet.

The question of limitation of capital ship tonnage was also influenced by the existence or otherwise of the submarine. United States proposals set the capital ship displacement at 32,500 tons per vessel. However, the Admiralty considered that the continued existence of the submarine entailed a larger tonnage since: 'A restriction in the size of capital ships limits the underwater protection of those ships and so adds to the strength of the submarine.'[57] The United States delegation's original policy had been to achieve reductions in all categories of warships. However, it was gradually accepted that the overall success of the Washington Conference would be threatened if some agreement was not reached principally in the submarine category. Therefore, the Americans proposed an increase in their submarine tonnage and that of Britain and Japan, in the hopes of persuading the French to accept a lower tonnage than they were claiming. Accorded minority status, France was known to favour large increases in her submarine forces. However, the British had come to Washington seeking the abolition of the submarine and therefore regarded the United States proposal as likely

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57. Admiralty, Dec. 1921, ADM 116/2150.

to open the 'floodgates', it being, 'a strange proposal to lay before a Conference on the Limitation of Naval Armament and one which if persisted in, will sanction, and even foster a new competition in the building and use of war vessels which are far more open to objection than any surface capital ships.'[58] The increase to be allowed over existing submarine forces was 7,689 tons for the United States, 9,524 tons for Britain, and 23,226 tons for Japan.[59] Italy was to be allowed to build up to one third of the British tonnage (an extra 11,744 tons) and the French were allowed 30,000 tons, irrespective of their tonnage demands, which in fact exceeded this figure.

The British delegation realised that the possibility of an agreement on abolition was being eroded, not only by the expected French opposition and tonnage demands but also by such statements as that by the United States Navy's General Board that the submarine was, 'an effective and legitimate weapon of warfare,' although, 'unlimited submarine warfare should be outlawed.'[60] This was damaging because the United States had been considered Britain's only certain ally on abolition. Nevertheless, the Admiralty had been fully committed to continuing with the approved policy despite the evidence that the Conference was moving against an abolition agreement. The American proposals were counter-attacked and British policy defined as being directed by humanitarian motives rather than fear of the submarine as a military weapon. On these grounds, the use of submarines against merchant shipping could not be tolerated. Moreover, although the British hoped that the submarine would be mastered by future A/S forces, the cost

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58. Lee to Committee on Limitation of Armaments (Washington Conference), 22 Dec. 1921, ADM 116/2150.

59. See Appendix: G(3).

60. S. Roskill, Naval Policy Between the Wars (London, 1968), 1, 328.

of the latter was considered prohibitive in peacetime. Therefore, once again the delegates were reminded that the aims of the Conference included reducing national expenditure on armaments, 'as far as is compatible with national safety,'[61] a factor on which the politicians and their military advisers tended to be divided. One factor the British were agreed on was that the submarine remained a serious menace to the sea routes of the Empire. Therefore, it was made clear that failing any agreement on abolition, Britain would be unable to reduce her destroyer tonnage below the existing level. This threat disguised the fact that the economic situation largely precluded any increases to this tonnage. Nevertheless, unless the United States delegation modified their proposals then the British found it impossible,

> 'to agree to any of the clauses of the U.S. proposals dealing with the smaller types of war vessels. No guarantee given in time of peace that submarine craft will not be put to an improper use in time of war can be accepted. It will therefore be seen that any unwillingness to accept the abolition of submarines on the part of other Powers will defeat the chance of an agreement being reached on a considerable portion of the U.S. proposals.'[62]

However, the Americans were aware of the economic importance to the British of achieving agreement on naval arms limitation. The additional refusal of the French and Italians to accept their allocated submarine tonnage as adequate meant a deadlock over auxiliary warships. The only result could be that the British threat would fail for lack of credibility. During the early sessions however, this conclusion was not absolutely certain and the British delegation continued to be energetic in their attempts to achieve

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61. Balfour to 2nd Plenary Session, Jan. 1922, ADM 116/2150.

62. Curzon to Balfour, 15 Nov. 1921, D.B.F.P., 1 ser., XIV, 475-76.

an agreement on abolition. Despite this, many decisions on the submarine continued to be made on the basis that it would continue in existence. For this reason, the American proposal for a capital ship building 'holiday' for ten years was received with mixed feelings by the British because of fears that battleship development would become stereotyped,

> 'while submarine development in numbers,' would, 'still be considerable and in design unlimited ... The three leading Naval Powers,' (Britain, United States, and Japan), 'may therefore easily find their whole naval position undermined by the swift development by Powers like France or Russia of large flotillas of far more powerful submarines.'[63]

Even a proposal by Admiral Beatty for a slow replacement programme of battleships was not considered to solve this problem. One suggestion was that a solution might lie in an 'arrangement' with the Americans on capital ships in return for support on the submarine issue.

> 'We therefore think that acceptance of the American proposal in regard to capital ships should carry with it the most rigorous restriction of submarine construction, if not indeed their complete abolition. The interests of the three leading Naval Powers who are to be signatories are clearly identical in this request. They ought to bring the utmost pressure upon minor Naval Powers not possessing battlefleets to conform, and they ought to adopt a common policy in regard to the non-signatory Powers. Such a line of argument would tend to throw Great Britain and the United States, more closely together, and we feel it should be thoroughly explored,' for, 'if the submarine can be banned absolutely or restricted to the narrowest limits, very great advantages will be reaped by the leading Naval Powers.'[64]

After consultation, the Government agreed to the recommendation of the C.I.D., that the main proposal on the limitation of capital ship numbers should be accepted in conjunction with a ten year building 'holiday'. The C.I.D. were aware of the possible detrimental effect of such a 'holiday' and therefore,

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63. Ibid.

64. D.B.F.P., 1 ser. XIV, 475-76. (See Note 62.)

> 'it was agreed that it would be to the advantage of Great Britain if submarines were totally abolished. In this connection it is important to remember that the battleships of the signatory Powers now in existence are not provided with protection against submarine attack as the vessels in the new construction programmes would have been. The battleships of signatory Powers would thus be placed at an increasing disadvantage during the next ten years, vis-a-vis submarines ... It, therefore, becomes a matter of common interest to the signatory Powers to minimise the activities of submarines, if not to secure their total abolition. It is important that such limitations as the signatory Powers themselves agree to assume should be pressed upon the non-signatory Powers.'[65]

Pressed they could be but to force acceptance was another matter and as the other signatory Powers themselves were known not to favour severe restriction or abolition of the submarine, this was an impossible target to achieve.

Meanwhile, the latest news from the British Embassy in Paris was equally gloomy.

> 'It is ... on the subject of the naval disarmament proposals as they are likely to affect France, that most disapproving comment has been made ... France has a large coast-line and lines of communication with her overseas Colonies to defend ... For this reason she must possess numerous light cruisers, and above all, submarines.'[66]

French press and public opinion also appeared firm in the belief that submarines,

> 'were invented by France for defensive purposes, and it was always her intention to build a large fleet of them. Ninety thousand tons,' was considered by the French to be, 'a very modest figure, insufficient to France's needs. But this is the total allowed to England. France must expect to have a yet smaller figure allotted to her.'[67]

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65. Curzon to Sir A. Geddes (H.M. Ambassador to Washington and a member of the British Delegation), 16 Nov. 1921, D.B.F.P., 1 ser., XIV, 476-77.

66. Lord Hardinge (Paris) to Curzon, 20 Nov. 1921, D.B.F.P., 1 ser., XIV, 492-93.

67. Ibid.

British submarine proposals were considered to be aimed purely at France, allied to attempts to regain dominance in the Mediterranean. Finally, in so far as the British policy involved attacking the possession by the smaller Powers, the French saw themselves as the champion of these nations. As if to emphasise this point, the Naval Committee of the French Senate now tripled proposed submarine construction to 56, spread over the next three years. However, it was known that no money had yet been provided in the Budget for the first twelve of these submarines, announced in the 1921 French Navy Estimates. The action of the Senate Committee was therefore taken as indicating that the French Government wished to have something to bargain with in case the question of land armaments arose at the Conference.

The continuing strength and inflexibility of French policy at Washington led to a further re-appraisal of British tactics. No advantage could be seen in distinguishing between ocean and coastal submarines due to the proximity of France to the focal point of British trade routes. Differences of opinion now existed between the British delegation and London, with the former declaring faith in the belief that the submarine could be mastered and the latter stating that: 'If France has a large submarine force in a future war Great Britain might be cut off for all practical purposes from sea-borne supplies.'[68] The situation on abolition was such that the C.I.D. were not above suggesting to the British delegation that they adopt an uncompromising attitude on the issue of French land armaments and then offer to compromise in exchange for France's support for abolition. The suggestion was rightly declined since such a move would have merely confirmed French theories on British tactics at

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68. Curzon to Balfour, 23 Nov. 1921, D.B.F.P., 1 ser., XIV, 499-500.

Washington. Balfour also emphasised that although efforts would continue to be made to achieve agreement on abolition, France and Italy were certain to combine against this policy. However, despite this accurate assessment of the practicality of the situation, efforts were to continue to dissuade the French of the necessity for retaining submarines. France's acceptance of a small battlefleet was also considered necessary. If neither of these proposals succeeded then the chances of British acceptance of the United States' proposals on auxiliary vessels was adjudged to be very slim.[69] A concession was to be made on the battleship tonnage to be allowed to France but only, 'in return for the virtual abolition of the submarines or at least the prevention of new building of submarines of any kind.'[70] Nevertheless, it had to be conceded that the chances of success were negligible and that, 'we must consider that the French will probably continue to assert their claim to a 60% battlefleet and to the full United States allotment of submarines.'[71] Lloyd George endorsed the recommendation that no further offers of concessions should be made on the other categories. However, the latest intelligence from Paris made it clear that the French were fully alive to the strategic advantage of their positions on using submarines against Britain. Further, they apparently did not contemplate signing any agreement inhibiting submarines from attacking merchant ships.

Balfour considered that the policy discussions at the Conference were approaching a crucial stage. The Technical Sub-Committee was expected to complete its deliberations on naval questions at any moment, when they

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69. Balfour to 2nd Plenary Session, 21 Nov. 1921, ADM 116/2150.

70. Curzon to Balfour, 27 Nov. 1921, D.B.F.P., 1 ser., XIV, 514.

71. Ibid.

would be presented to the main Conference. The United States was now considered to have a better understanding of the British position on the submarine but, nevertheless, the best that would be expected was lukewarm support on quantitative tonnage limitation. British tactics on abolition were therefore altered to include the offer of scrapping their entire submarine force in return for similar action by the other major naval Powers. In the probable event that this offer failed, then the policy was to accept no restriction of numbers of A/S vessels or on the arming of merchant ships.

Meanwhile, in London, the debate continued on the wisdom of restricting submarine policy at the Conference to the issue of abolition. The Naval Staff advocated an alteration to concentrate on limitation agreements since, 'the question of abolition would appear to be of greater academic interest rather than of practical concern.'[72] The suggested alternative was, 'to endeavour to get the individual displacement of submarines reduced to the lowest possible compatable with the defensive.'[73] Once again the French and Italians proved a major obstacle, since they were known to want to use the bulk of their submarine tonnage for oversea boats. Nevertheless, these proposals represented a change of attitude away from total preoccupation with abolition, and from the position held earlier in the Conference, of accepting no policy which implied that a limitation in the size of any particular class of submarine was feasible. However, the question of a proposal for small submarines to be allowed to France and Italy had

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72. D. of T.D., 2 Dec. 1921, ADM 1/8616/213, 'Comments on Memorandum Submitted by Naval Staff (29 Nov. 1921) on "Abolition of Submarines - Remarks re and Proposals for Limitation of Submarine of all Powers".'

73. Naval Staff, 5 Dec. 1921, ADM 116/3447, 'Possible Attitude of French and Italians Towards Abolition of Submarines.'

been considered and rejected, due to the proximity of those countries to British trade routes.[74] On the question of American support, the Foreign Office now tended to the view that this was unlikely, due to public opinion within the United States. The Foreign Office also concluded that the French would stubbornly resist any offer, even of an alliance, in return for renunciation of the submarine since they had made clear that the retention of such vessels was vital to their national defence. Feelings in the Foreign Office were that the advent of submarines and aircraft tended to remove natural frontiers such as the English Channel and reduce Britain to the same position as that of a continental Power.[75]

The Admiralty was aware of the weakness of the overall British position and their assessment of situation was that,

> 'we did not come over here as a wealthy country, nor with a Government behind us prepared to back our Naval aspirations. We were, and have been for the last two years in a position of great anxiety, and there appeared no probability that this anxiety would be lessened in the future. As long as America and Japan continue to build against each other, Great Britain's position will be financially hopeless ... we have already accepted as a nation, equality with the United States, and this in itself cannot be reconciled with our requirements in the world. We did not accept it from a strategical standpoint, it was forced upon us by the financial standpoint.'[76]

On the specific issue of the submarine there was considered to be little chance of achieving any agreement favouring abolition, despite the possible effects of the First Lord's speech at the forthcoming Public Session.

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74. Foreign Office to Admiralty, 22 Nov. 1921, ADM 116/2149, 'Notes on the Limitation of Submarines.'

75. Sir William Tyrell (Under-Secretary of State for Foreign Affairs) to Admiralty, 23 Nov. 1921, ADM 1/8609/138, 'Views on Report of Captain A/S.' (See Note 48.)

76. Chatfield to D.C.N.S., Vice-Admiral Keyes, 29 Nov. 1921, Keyes MSS, 7/12, 1-2.

Therefore, Rear-Admiral Chatfield concluded that the most realistic approach was to,

> 'try to obtain as great a reduction in numbers and size of submarines as possible without agreeing to restrict ourselves in any way in the numbers and types of craft we may build to meet the menace. The United States has agreed with us that if we have to settle a submarine ration, the three great Naval Powers should informally decide among themselves the ration for all Powers. I think the United States will help us in keeping the ration as low as possible and France will have to give way or be in opposition to us all. Personally, I do not greatly fear submarines and am convinced that the progress of research and science either on the line we are going, or on other lines will, in the course of time, render them obsolete.'[77]

Chatfield could have had little ground for confidence at that stage, and his emphasis on the promise of future developments was to that extent a placebo. On the attitude of the French, events were to prove him totally wrong. There was also the view that any threat stemming from French and Italian possession of the submarine was exaggerated, although the reasons advanced to support this theory appeared dubious, emphasising as they did that French and Italian submarines were too inefficiently handled to carry out a commerce war.[78] Clearly, effect rather than accuracy appears to have been the motive behind this report.

The Admiralty now accepted that it was likely the British delegation would have to settle for an agreement on limitation rather than abolition. The Naval Staff considered that a qualitative limit of 1,200 tons would be a suitable figure. This limit meant that few existing submarines would have to be scrapped and therefore it was hoped that the other major Powers would be more amenable to qualitative limitation than they had been to abolition. Whatever the outcome, however, it was accepted that in the

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77. Ibid.

78. Keyes MSS, 7/12. (See Note 76.)

event of retention of the submarine it was extremely important not to throw away what advantages were held in the development of the existing British force. This was estimated to hold a lead of approximately five years, following the removal of the Germans from submarine possession or development. In addition, various views were now advanced by different groups to support retention of the British submarine. Despite their pre-Conference opposition even the Naval Staff were prepared to advance a proposal. This, despite the evidence of the First World War was that: 'The submarine is indispensable to us at advanced and poorly protected bases.'[79] The Naval Staff also favoured the continuing use of the submarine in the reconnaissance role, where it had been very successful between 1914-18. Others led by the D. of G.D., argued that in any future maritime conflict it would be possible for an enemy to build up a submarine force much more rapidly than Britain could develop and construct A/S forces. Therefore submarines in the Royal Navy in peacetime would be useful in providing training for a permanent A/S force which the retention of the submarine by other Powers would make necessary. Failure to provide and adequately train such a force meant that, 'this country with its far distant Dominions and long and vitally important Trade Routes would be at a very serious disadvantage.'[80] However, the economic disadvantages which had brought the British to Washington precluded official support for the retention of the submarine purely on the grounds of A/S training or protection of overseas bases. However, the same economic and political restrictions affected the provision of adequate numbers of major surface

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79. Naval Staff, 4 Dec. 1921, ADM 116/2149, P.D. 01664/21, 'Notes on the Abolition of Submarines.'

80. D. of G.D., 6 Dec. 1921, ADM 1/8616/215, 'Views on Naval Staff Memorandum of 4 Dec. 1921.'

units and ensured that the question of port defence, especially in the Far East, remained at least a factor affecting naval policy on the submarine throughout the inter-war period. Opposition to retention for A/S training tended to stem mainly from the consequent need for lavish expenditure on A/S forces and it gradually became official policy to link submarine and A/S forces together in disarmament negotiations. Logically, it was considered that the fewer the submarines allowed to foreign Powers the greater would be the advantage to Britain in terms of a reduced need for A/S forces.

Meanwhile, the Naval Staff urged that the advantages to Britain of abolishing the submarine now depended to a certain extent on the theatre of operations. In European waters, abolition was considered an advantage, while in the Far East submarines were regarded as useful for local defence and to fight holding actions until the arrival of the main Fleet. In late December 1921 Vice-Admiral Keyes came out strongly in favour of limited retention. 'I have never considered that total abolition is a practical proposition and am strongly of the opinion that a limited retention is really in our best interests.'[81] There was also the apparently insoluble problem in any submarine agreement, of not only persuading the non-signatory Powers to sign but also ensuring that they did not renege. Therefore, the reason for the continued pursuance of the abolition policy as Washington became largely one of tactics, with the object of gaining concessions in other categories. Instructions to the British delegation were that:

> 'We are not binding you in any way about the construction of cruisers and small craft of every kind. That is a different and far more

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81. Keyes to Chatfield, 10 Dec. 1921, Keyes MSS, 7/12, 'Abolition of the Submarine.'

> 'complicated side of the question and although we would pay a great deal for the complete abolition of the submarine, yet if this cannot be attained we are sure British interests will not be injured by complete freedom of construction. The purely naval interests of Great Britain will be well secured by a ten year absolute naval holiday in capital ship construction plus perfect freedom in the construction of smaller craft. Alternatively, they would be well secured by the said naval holiday in capital ships plus the abolition of submarines and a limited construction of smaller craft which took proper account of our need in this respect. This second alternative however is more complicated and doubtful than the first, and an agreement would probably be far more difficult to arrive at.'[82]

On the 19 December the British delegation forwarded a request to the Americans for a public Session of the Conference, in order to make a final plea for abolition.[83] The United States Secretary of State made it clear to Balfour that while he agreed with the British view, his naval advisers and the Advisory Committee, which wielded strong influence, did not. Moreover, within the Conference all the Powers, except the United States, had already declared their opposition to abolition and in a public session would be supported by a majority of the interested smaller nations. Finally, it was suggested that if the British were agreeable to present their views in a private Session then there was a good chance of revised proposals from the United States. These would be aimed at a flat rate limit of 40,000 tons for each of the major Powers and a resolution against the misuse of submarines. Despite reservations about the value of such resolutions, Balfour agreed to put the suggestion of a private Session to the British delegation.[84] There it was decided to agree with the American

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82. Curzon to Balfour, 9 Dec. 1921, D.B.F.P., 1 ser., XIV, 545.

83. British Empire Delegation, 19 Dec. 1921, ADM 116/3447, '14th Meeting.'

84. Balfour to Curzon, 19 Dec. 1921, D.B.F.P., 1 ser., XIV, 567-68. See also: British Empire Delegation, 20 Dec. 1921, ADM 116/3447, '15th Meeting.'

request and put the case before the Committee on Limitation of Armaments.[85] The attitude of the American press was that with opposition from four Powers, Britain would not achieve abolition. Certainly, the British Government was in receipt of reports from Paris that French political opinion remained determined to ensure no curtailment of submarine construction.[86]

On the 22 December, Lee began his speech by admitting that on the proposal for abolition the British delegation found itself unsympathetic to the United States delegation's latest proposals. Attempts to disprove that the submarine was a necessary weapon for the weaker Power led him to attempt reasons why it was inadequate for coastal defence. On the evidence of the First World War, Lee was making a correct statement, although for the wrong reasons,and despite the views of the Naval Staff.[87] Many of the differences between established facts and statements in this speech were the result of the need to tailor it to fit the proposal for abolition. Thus, despite the recent reports on the existing limitations of Asdic, the attitude adopted was that in future wars the submarine would have little chance of success, 'against properly equipped fleets of even individual modern warships.'[88] True or not the fatal fact was that as a result of Washington and later naval arms limitation treaties, the bulk of the Royal Navy was to consist of modified First World War designs which could not be construed as properly equipped or modern. Meanwhile, claims that

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85. Balfour to Curzon, 22 Dec. 1921, D.B.F.P., 1 ser., XIV, 569.

86. D.N.I., 21 Dec. 1921, ADM 116/2150.

87. Naval Staff, June 1921, ADM 1/8948, 'The Naval Situation in the Event of War Between Japan and the United States.'

88. ADM 116/2150, Lee to Committee on Limitation of Armaments. (See Note 58.)

the U-boat had proved ineffective against the British Fleet ignored both its effect on naval tactics, with large numbers of destroyers needed to screen the Fleet at sea, and the success of the submarine against merchant shipping. However, whatever arguments were advanced it was accepted that Franch remained the main stumbling block to an abolition agreement. Attempts were therefore made to undercut the French position, including the desperate offer to scrap the entire British submarine force, if the other Powers did likewise. Although failing abolition, the logical step was to seek some form of limitation of tonnage and/or use, for the purposes of this speech it was maintained that no alternatives to abolition would be acceptable to the British. The speech was obsolete before it was given, with Conference opinion already in form opposition to abolition. This weakness was reflected in the tone of desperation which permeated the entire presentation and culminated in the proposed reaction to any refusal of the smaller Powers to abandon the submarine. 'If, however, the Great Naval Powers having a self-denying ordinance, should find themselves exposed to hostile action by smaller States practising methods of piracy, they would find means ... of bringing Nemesis upon the transgressor.'[89] This was an impressive piece of rhetoric but more hypothetical than practical as the record of international co-operation and the League of Nations was to prove.

The practical effects of Lord Lee's speech were also negligible, as the American Press pointed out.

> 'We could have wished that it had been a representative of the United States and not the First Lord of the British Admiralty who presented the case. Great Britain has more lines of communication by sea than any other

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89. ADM 116/2150, Lee to Committee on Limitation of Armaments. (See Note 58.)

> 'Powers and would therefore benefit more than any other if the submarine were outlawed or closely limited in number and tonnage. Coming from Lord Lee the argument for reduction has an air of special pleading which militates against its acceptance.' Nevertheless, the conclusion was that it would, 'be found far easier to prevent the forging of these weapons, either at the present Conference or later, than to place restrictions on the uses to which they may be put after they have been made.'[90]

Following Lee's speech, Sir Maurice Hankey wrote to the Prime Minister that, 'we shall be beaten in regard to the abolition of submarines ... After that, I am not clear at the moment of writing that we know exactly what we are making for, except that if submarines are retained, we must insist on a free hand in anti-submarine activities.'[91] Within a few days the situation had further deteriorated when the French refused to accept a quantitative tonnage limit below 90,000 tons. In effect this was a claim for parity with the figures proposed by the United States for itself and Britain. A strong feeling existed among the British delegates that the acquisition of such a large submarine force by France could only be directed against Britain, since they could see no other logical reason to justify the tonnage demanded. The proximity of British trade routes to France, especially those leading through the Mediterranean, provided the most sensitive reason for the British opposition to expansion of French submarine forces, even if the latter's purpose was claimed to be defensive. Attempts were made to brand the French as supporters of unrestricted submarine warfare and reference was made to statements by Admiral de Bon and articles by Capitaine de Fregate Castex, in which the latter had

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90. 'New York World', 24 Dec. 1921, ADM 116/3447.

91. Hankey to Lloyd George, 22 Dec. 1921, D.B.F.P., 1 ser., XIV, 569-73.

appeared to justify the unrestricted use of submarines.[92] The question was settled by the French repudiating both the article and the interpretation by Lord Lee.

Following the failure over abolition the British delegation was now wholly committed to achieving agreement on submarine tonnage limitation. The French request for 90,000 tons was considered totally unsatisfactory but United States proposals for a maximum of 60,000 tons with France, Japan, and Italy being restricted to their existing tonnage (31,390: 31,452: 21,000), were more acceptable. However, all prospects of such an agreement were destroyed by the French reiteration of their refusal to accept less than 90,000 tons.

Root Resolutions

Despite the original British view that rules governing the conduct of submarine warfare were unenforceable in war, the Conference now turned to consideration of such proposals. The Admiralty view was that, 'it should be made quite clear to the United States Government that the British Delegation are not empowered to discuss rules of methods of warfare at sea.'[93] This was reaffirmed following the news that the United States had decided to submit suggestions for rules on the conduct of submarine warfare. The British were also concerned about the other Powers seizing this issue as an excuse to curtail the practice of searching neutral merchant shipping on the high-seas during wartime. However, because of the probability of becoming isolated from the position held by

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92. 'Synthèse de la Guerre Sous-Marine,' La Revue Maritime, Jan. 1920, 162-65. (Quoted in ADM 116/3447.)

93. Admiralty to C.I.D., Dec. 1921, ADM 116/1852, Paper no. 277B.

the other major Powers, the recommendation was that initially the British delegation should propose that 'submarines should be guided by the existing rules for "visit and search" already approved by International Law for warships generally and that,' submarines, '... should signify their willingness to adhere to such rules as long as they are observed by the adversary.'[94] If accepted, this meant that all but the largest submarines would be precluded from attacking merchant ships, since they could not carry prize crews or accommodate prisoners. Stress was also laid on the fact that no other regulations were to be accepted for the conduct of war at sea; any agreement for restricting submarine warfare was not considered to provide adequate safeguards for the British Empire, nor was any such agreement to be considered as restricting the prosecution of A/S measures by Britain.

The need to accept a policy on restriction of submarine operations was considered to be, 'a plain and logical outcome of ... failure to secure the abolition of submarines at the present Conference.'[95] Nevertheless, it was now realised that the failure of the abolition policy meant that some form of legal restrictions would have to be agreed upon and this made it necessary to secure the best possible terms for Britain. Initial proposals, by Mr. Elihu Root,[96] consisted of three resolutions which became known as the 'Root Resolutions'. For obvious reasons, the British favoured such clauses as: 'A merchant vessel must not be attacked unless it refuses to submit to visit and search after warning.'[97] This

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94. Naval Staff, 27 Dec. 1921, ADM 116/2149, 'Rules for Submarine Warfare Against Merchant Shipping.'

95. Ibid.

96. Root, Elihu, United States Secretary of State, 1905-09; member of the U.S. Delegation at Washington Conference, 1921-22.

97. See Appendix: H(1).

restriction, if obeyed by a submarine commander, removed the element of surprise inherent in underwater attack by forcing the submarine to operate on the surface. In addition, the British were adamant that they would favour defensive arming of merchant shipping since this enhanced the chances of survival against the submarine which was more vulnerable on the surface. However, the arguments proved inconclusive over whether use of defensive armament made a ship's civilian crew into servicemen. Another useful clause for the British concerned the fate of passengers and crew. Under the Resolutions the merchant vessel could not be sunk until civilians had been transferred to a place of safety. In this case, the ship's boats were not acceptable as conforming to such a requirement. Clearly, without surface support the submarine could not accommodate prisoners.

There was no disguising that the Root Resolutions contained weaknesses, nevertheless, the Admiralty hoped that a belligerent Power would adhere to such an agreement, at least in the initial stages of a war, in order to increase or retain neutral support. Moreover, in the event of a violation, some of the major Powers might be prepared to enforce the Resolutions, if these were to their advantage. However, this was a slim possibility, not one to be relied on. Specific Admiralty doubts on the wording of the Resolutions were concentrated in two areas. These concerned Resolution IV, termed the 'Piracy Resolution', and the traditional policy of blockade. Balfour emphasised the strength of feelings, in a telegram to the Prime Minister.[98] Originally, Resolution IV had affected only submarine officers, but, as a result of amendments by the Italians, criminal responsibility for violating the rules was extended to include the officers and crew of surface warships as well as submarines. British

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98. Balfour to Lloyd George, 13 Jan. 1922, D.B.F.P., 1 ser., XIV, 598-601.

reaction was unfavourable.

> 'Great Britain is compelled to keep submarines and a resolution of this nature will imperil our submarine personnel. Officers will not remain in a service where they ... in consequence of some slight error of judgement involving the destruction of a merchant ship ... may be called before a foreign court and condemned offhand as pirates.'[99]

In addition, Resolution IV was not considered a real deterrent. Much of the unease felt by the British delegation stemmed from the fact that the term piracy had previously only been accepted as describing the actions of forces acting without legal authority.[100] On these grounds, Resolution IV could be interpreted as meaning that only five Powers were competent to frame international law. This was clearly impractical even allowing that such law only existed under the voluntary acceptance by sovereign states of any or all of its provisions. Confirmation of this belief that interpretation of international law was essentially subjective was supplied by the view that: 'Generally it may be observed that in all the resolutions except the fourth one we have merely restated in emphatic and authorative terms what Great Britain has always regarded as part of existing international law.'[101] Nevertheless, if Britain adhered to the existing draft of Resolution IV as recommended,[102] then by existing law it would only apply to the Signatory Powers and they in turn would have to ratify any agreement on the Resolutions before they became effective. Failure to achieve ratification precluded persuading any non-signatory Powers to adhere to the Resolutions.

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99. Chatfield (Washington Delegation) to Admiralty, 3 Jan. 1922, ADM 116/2149.

100. British Empire Delegation, Jan. 1922, ADM 1/8622/54, 51st Meeting.

101. D.B.F.P., 1 ser., XIV, 598-601. (See Note 98.)

102. British Empire Delegation, Feb. 1922, ADM 116/3447, 63rd Meeting.

The other area of concern to the British involved the policy of blockade. Traditionally, blockade had been one of the most valuable weapons of British sea power and attempts to blunt this weapon had always been firmly resisted. However, the First World War had seen an alteration in the system of blockade, occasioned by the advent of new technology. The old policy of close blockade had been abandoned in favour of a distant blockade. The failure to achieve abolition of the submarine meant that the question of blockade had to be re-studied, not only in relation to these boats preventing a blockade but also in their use to enforce a blockade. The majority view, at Washington, was that the submarine could not be used in any form of blockade; a decision finally accepted by the British. All Conference Powers finally agreed to recommend the four Root Resolutions, renamed the Root Treaty, to their respective Governments for ratification. This was the only agreement on submarines reached at the Conference and even this was nullified, when later the French Senate refused to ratify the document. The repercussions of the Washington Treaty on the Limitation of Armaments, signed on 6 February 1922, on British submarine policy were still unresolved several months later. The majority of problems sprang from the Root Treaty. Clarification was sought on whether submarine personnel accused of being quasi-pirates could, 'only be tried in a country where legislation has been passed defining the violation of these laws of war as equivalent to piracy.'[103] The legal ruling was that,

> 'enemies can never commit acts of piracy on each other, their depradations being deemed mere acts of hostility.' Moreover: 'The taking,' of a ship, 'to be piracy must be without authority from

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103. Admiralty Legal Staff, 23 Feb. 1922, ADM 1/8622/54, 'Washington Conference: Root Resolutions Regarding the Use of Submarines - Legal Questions Involved by the Piracy Resolution.'

> 'any prince or state, for a nation never can be deemed pirates.' However: 'Subject to the above, though the act can be done by a foreigner, and outside British territory e.g. on the high seas, a British Court can try a pirate.'[104]

Despite this ruling; as late as 1926 the Admiralty considered it necessary to state that, 'if in a naval war we were forced to sink merchant ships as a reprisal we might have to suspend or abrogate this provision in our Act (i.e. Washington Treaties).'[105] This also ignored refusals to ratify the agreement which meant it was already null and void under international law.

During July 1922 a detailed report on the Washington Conference was presented to the First Lord. This drew attention to an apparent inconsistency in British naval policy, stemming from a recommendation to the Dominions by the Admiralty that submarines should be included in their naval forces. In hindsight this appeared difficult to reconcile with official British policy at Washington, 'where a policy total abolition was advocated.'[106] This inconsistency stemmed from the fact that there were advantages as well as disadvantages in the use of submarines. Although an agreement on abolition would have been preferred, the Admiralty had no delusions about the value of submarines 'based on war experience confirmed in Fleet exercises which had since been carried out.' The Root Resolutions, 'although admirable in intention cannot be relied upon when formulating war plans for the defence of commerce.'[107] Taken together these points resulted in the Admiralty considering that no inconsistency of policy existed and this led to the recommendation being placed before the 1923 Imperial Conference.

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104. Ibid.

105. Admiralty, 1926, ADM 1/8700.

106. Naval Staff, July 1922, ADM 116/3165, 'Root Resolutions in Regard to Submarine Warfare.'

107. Ibid.

If the Washington agreements were allied to the 'Ten Year Rule' then the naval defence of the Empire was likely to be in a perilous position unless additional provisions were made for defence requirements. The Admiralty considered that despite the economic situation of the nation, efforts should be made to build up military strength rather than rely on the paper promises of other nations. One effect of the reliance on Treaty provisions as a means of national security was seen in the decision to replace the Anglo-Japanese naval alliance with a Four Power Pact. Thus: 'The strategic situation in the Western Pacific has changed for the worse ...; now, until the arrival of the main fleet two classes of vessels will be of the utmost value in the Pacific.'[108] One of these was the submarine but in 1922 no new British submarine had been laid down for four years and the total submarine strength in the Royal Navy had declined to less than 50 boats.

Although the Washington Conference achieved agreement on limitation of battleship tonnage it failed in a similar respect with submarines and military aircraft, both of which were potentially more important weapons than battleships. Obviously this is clearer today than in 1922 when the battleship continued to be considered as the mainstay of any navy. The success of the British submarine during 1914-18 appeared to have secured its place in the Royal Navy. In less than twenty years this vessel had been developed from a coastal boat with limited endurance to designs capable of an endurance of several thousand miles in all seas and weathers. Nevertheless, in common with all other categories of naval vessels the submarine force was rapidly reduced in numbers. Moreover, to many people,

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108. ADM 116/3165, Naval Staff, 'Root Resolutions.' (See Note 106.)

in a negative way, the abolition of the submarine appeared to provide greater advantages for Britain than retention. Besides the hostility and fear which stemmed from the experience which the Royal Navy had gone through in 1917 at the hands of the Germans, the Submarine Service had also to contend with the attitude which saw the submarine as a threat to the battleship; this attitude was enhanced by the difference in the cost of the two weapons. Undoubtedly, in this sense, Britain's investment in battleships contributed to her perceived vulnerability to the submarine. Although the Admiralty reaffirmed the Navy's faith in the battleship it was not oblivious to the advances of technology; but it still believed that the demise of the battleship was not imminent. Therefore, the preparation of naval policy for the Washington Conference did not relate to submarine construction in the same way as it affected capital ship programmes.

In the immediate post-war period only the continued possession of the submarine by the other major Powers and the need to retain continuity of knowledge prevented the total eclipse of the British submarine force. Development was therefore limited by the Admiralty to the minimum level considered necessary to meet these requirements. Thus, although proposals on submarine abolition had been vigorously pressed at Washington, they were not as important either domestically or internationally as the capital ship proposals. As far as capital ships were concerned the French were resentful over what they considered to be relegation to second rank status. The Japanese were also bitter, not only on the question of the ratio allocated to them but also over the severing of the Anglo-Japanese Alliance. Although the Four-Power Pact left Japan in a potentially powerful position in the Pacific, SINCE BRITAIN COULD FORTIFY NO BASE FURTHER EAST THAN SINGAPORE UNDER THE TERMS OF THE PACT, the more militant elements in Japan regarded the overall Washington Conference as a diplomatic defeat. These were resentments which threatened to bear fruit in differing ways in the future. In

Britain, naval opinion brought up on a tradition of a 'two-power' standard was not unnaturally unenthusiastic over the results of the Conference. The reluctance to accept a voluntary sharing of global naval power was understandable as Britain had a far greater need of a navy than any of the other major Powers. Nevertheless, the realities of economic weakness could not be avoided and even the most passionate 'two-power' supporter had to accept the realisation that results of a naval race were now economic ruin for Britain. For the Submarine Service the period following the Washington Conference was one of struggle, marked by the Government's determination to continue pressing for abolition of the submarine, allied to financial stringency and a restriction on resources for development and construction.

CHAPTER 8

1923 - 1927

DOMESTIC SUBMARINE POLICY AND THE 1927 TRIPARTITE NAVAL CONFERENCE AT GENEVA

The failure of the Washington Naval Conference to produce an agreement on abolition marked the end of the first phase of British post-war submarine policy, and resulted in a reassessment of the Royal Navy's submarine requirements. An Admiralty conference was scheduled for early May 1922 so as to assess the possible submarine models that might be required.[1] In the general financial climate of the time there could be no possibility of producing improvements to all the types of submarine with which the Royal Navy had ended the War. As the Anglo-Japanese Alliance was not to be renewed in 1922 a requirement arose principally for a new overseas patrol submarine, with increased endurance and habitability, for deployment in the Far East. The Naval Staff considered submarines essential to defend ports and bases in that area in the event of war, until the main Fleet could arrive. These factors led to the Conference concluding, 'that it was of primary importance to develop a submarine for distant patrol work.'[2] This requirement resulted in the 'O' class design and preparatory work began as soon as the conference finished.[3] Some

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1. D. of P., Apr. 1922, ADM 138/676, S.0470/22, National Maritime Museum (N.M.M.), 'Agenda for 2 May Conference on Future Submarine Requirements.'

2. A.C.N.S., May 1922, ADM 138/676, N.M.M., 'Report of 2 May Conference.' (Delegates: R.A.(S), Rep. of C. in C. Atlantic Fleet, D. of P., D. of G.D., D. of T.D., D.N.C., D.N.E.(S), H. of T.S., Rep. of D. of S.D.)

3. D.N.C. to E. in C., 5 May 1922, ADM 138/676, N.M.M., 'New Submarine Design of Oversea Patrol Type.'

disagreement existed whether certain submarine models other than the patrol type should continue in development but it was recognised that financial factors especially made further development on other submarines impractical.[4] Whatever the wishes of the various Heads of Departments, the situation was such that: 'In the immediate future, when economy will effectually limit our submarine construction programme, we should concentrate on the oversea patrol type.'[5]

Meanwhile, the 1922 Estimates indicated that the number of submarines to be maintained in commission and Reserve would drop from 85 to 58. To bolster numbers the six submarines on the China Station were to be retained but classified officially as being kept in Reserve.[6] In view of the later recommendation put to the 1923 Imperial Conference that the minimum number of submarines required for Imperial defence was 78 (comprised of sixteen flotillas plus two boats in Reserve) 58 was clearly an inadequate number.[7] However, the force level was largely dictated by economic factors, with the decline in numbers continuing to an estimated 55 boats by 1926. The Washington Treaty laid down a twelve year life for submarines and this meant that unless there was a radical change of attitude towards construction, it would be necessary by the early 1930's to build a further 45 submarines to meet the defined minimum requirements.[8]

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4. C. in C. Atlantic Fleet, Admiral Sir Charles E. Madden to Admiralty, 4 July 1922, ADM 158/676, 853/A.H.0010, S.0.980/22, N.M.M.

5. D.C.N.S., Vice-Admiral Keyes, 30 May 1922, ADM 158/676, N.M.M., 'Admiralty Conference of 2 May 1922.'

6. First Lord, Arthur Hamilton (Baron Lee), 1922, ADM 116/3706, 'Navy Estimates for 1922.' (Cmd. 1603.)

7. Admiralty, 1923, ADM 116/2311, 'Resolutions of Imperial Conference.'

8. See Appendix: H(2).

Therefore, during the summer of 1923, the Admiralty proposed to the Treasury a programme to rectify the deficiency. Calculations indicated a minimum annual construction rate of seven patrol submarines from 1925-26. The reply was a request for further reductions in the Navy Estimates not only to relieve economic pressure on the Government but also as a denial that:

> 'A Conservative Government ... always wastes the taxpayers' substance in armaments and neglects his social development. We can of course rejoin that we are bound to ask the nation to provide what is necessary for the defence of the Empire; but we must be careful to see in that case that only what is necessary is provided.'[9]

The essential argument concerned what each side considered to be 'necessary'. The Government was pledged to 'a policy of economy and of debt reduction.'[10] Military opinion held that there was a possibility of Japan proving hostile in the future[11] but Baldwin was equally firm in the belief that Japan was, 'markedly friendly.'[12] However, as a result of the Four-Power Pact signed at Washington, the only Power in a position to restrain Japan was the British Empire since the United States was prevented from constructing any naval bases nearer to Japan than Pearl Harbour. If it proved necessary to send a Fleet to the Far East, even under ideal conditions the time needed would be four to six weeks. Therefore, existing naval forces in the area such as cruisers and submarines would have the task of delaying any Japanese naval movements for this period. In order to strengthen naval defences in the Far East without increasing the Navy Estimates the

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9. Prime Minister, Stanley Baldwin, to First Lord, Leopold Amery, 17 Aug. 1923, ADM 116/3387.

10. Ibid.

11. C.I.D., 19 June 1923, ADM 116/2247, Paper 195C, 'Empire Naval Policy and Co-operation: 33rd Meeting of the Standing Sub-Committee on Defence.'

12. ADM 116/3387, Baldwin to Amery. (See Note 9.)

recommendation was that Australia should be persuaded to order six overseas patrol submarines.[15] The 'O' class were proposed as being the most suitable and eventually the Australians agreed to purchase two.

Admiralty fears over possible Japanese hostility were increased by reports circulated during June and July 1923 that the Japanese appeared to be interested in acquiring cruiser submarines. This was viewed as a possible additional threat to convoys to Singapore or Hong Kong. It is difficult to understand why these Japanese submarines should have been considered as a danger to the Eastern convoy assembly ports as they would have been operating thousands of miles from their own bases without surface support and it had already been stated, at Washington, that surface support was necessary for long-range submarine operations. One possible answer is that such a pessimistic attitude was a reflection of the need to force additional resources from a reluctant Government; but it was also a reflection of British doctrine. Even in the late 1930's it was maintained that British submarines could only operate a continuous patrol in Japanese waters if they were based on Hong Kong rather than Singapore. These analyses also shed an interesting light on British naval thinking as to the use of Asdic with the convoy system. 'It has been under consideration to provide Asdic protection only with a few hundred miles of points of assembly for the long distance ocean convoys. It will now be necessary ... to provide whole voyage Asdic protection and the number of protecting vessels required will be largely increased.'[14]

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15. ADM 116/2247, C.I.D., 'Empire Naval Policy.' (See Note 11.)

14. D.N.I., 25 June 1923 - 9 Aug. 1923, ADM 1/8636/40, 'Japanese Activities in Germany with Regard to Obtaining Plans of the Cruiser Submarines.'

Meanwhile, despite the Government's belief that there was no perceptible threat to justify immediate increases in the Navy Estimates, they were anxious to find a means of reducing the severe unemployment which existed in Britain. 'There had, of course, been unemployment before 1914, but it had fluctuated heavily, falling to three or four per cent in good years, and rising to ten per cent and over in years of depression. The novel feature of post-war unemployment was that it continued at a permanently high level.'[15] Abnormal unemployment levels were concentrated in certain areas of the country and in the ailing traditional heavy industries, especially shipbuilding. The result was successful pressure for orders to be placed with shipyards: specifically an immediate £23.5 million programme to be spread over five years.[16] The plan included the laying down of three patrol submarines in the initial stage of the programme. Sanction for these and other orders had been given by the Chancellor of the Exchequer, prior to the granting of Parliamentary approval. This was contrary to normal practice and underlined the Government's view of the urgency of the domestic situation.

The Ten Year Construction Programme

By 1924 the implication of the Washington Naval Treaty had been largely absorbed. As a result the Admiralty, fettered by Government economic policy and the 'Ten Year Rule', mounted a major offensive to secure assurances about the size and cost of the Royal Navy up to 1935. The form chosen was the presentation of a ten year construction programme. The Washington Conference had imposed a ten year building 'holiday' on capital ships and the Admiralty therefore concentrated on the other

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15. R. Skidelsky, Politicians and the Slump (London, 1970), 15.

16. Board of Admiralty, 21 Nov. 1923, ADM 1/8702/151, 'Special Programme of New Construction.'

categories of warship. Despite the change of Government in January 1924 pressure was maintained, leading to consideration of the proposed programme by the Cabinet in March. In the submarine category, assessment of required numbers was not to be based on the total of submarines possessed by other nations but rather on the potential threat posed by the strongest possible opponent in European waters (France) and in the Far East (Japan). These selected 'threats' were neither immediate nor, at the political level, inevitable. The two fleets did however represent paradigms of what might have to be faced in military terms, if the uncertain international climate worsened, as even the Foreign Office conceded it might. The original programme included a final force total of 60 patrol, twelve cruiser, and eight fleet submarines.

The requirements for the latter model stemmed from the fact that this was still a period in which naval thinking accepted the battlefleet as the decisive instrument of naval power. In the scenario of the ideal Fleet action the fleet submarine would manoeuvre, on the surface, around the scouting screen of the enemy Fleet and launch a submerged attack once in position. This was expected to disorganise the enemy and allow the British Fleet to gain a decisive result. Therefore, the torpedo was to remain the main armament with the gun being considered of little importance. However, it is surprising that, after a decade of development but no battle experience, the fleet submarine was still considered to be a complement to Fleet operations. 'There is at present very little experience ... to show how much value should be attached to Submarines in a Fleet Action, but it is considered that if these vessels have a high surface speed (about 26 knots) they should be able to get into positions from which they can submerge and attack.'[17] The Admiralty continued to be troubled throughout

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17. Tactical Division, March 1924, ADM 1/8672/230, T.S. 3911, 'Fleet Submarines.'

this period by the costly difficulties of producing sufficiently powerful diesel engines to attain this objective. It was a difficult technical problem in itself, but the small number of submarines envisaged for the role made it, by any standards, a costly investment. Moreover, the function of the fleet submarine was essentially confined to Fleet operations and even in this role the only alternatives were torpedoing disabled warships and Fleet reconnaissance. The latter role was better suited to surface cruisers and, in areas where the submarine was useful in reconnaissance, the patrol model was preferred because of size and cost. In addition, the limits of technology marked out an uncertain future for both the fleet and cruiser submarines, with the result that the Admiralty laid the greater stress on the need for patrol submarines.[18] It is hard to avoid the conclusion that these types of 'heavy' submarines were retained for intra-service reasons rather than for any general strategic function. The incidence of Fleet actions was not at all high, but it would be a great thing for the Submarine Service if their vessels could be made fit 'to be in the line' - even if it meant that some awkward compromises had to be made over other functions, and other types of submarine.

Meanwhile, despite wanting the multiple objectives of improved patrol models, greater numbers of operational boats and increased experimentation, the Admiralty still considered it necessary to maintain a sense of practical proportion on the question of numbers if a successful conclusion were to be achieved. In order to improve the probability of acceptance of their proposals the Admiralty attempted to present the submarine as a necessary naval weapon with a purely military role such as reconnaissance or anti-warship. This was clearly a difficult task so soon after Washington, and

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18. Plans Division, Apr. 1924, ADM 1/8072/230, P.D. 02004/24, 'Ten Year Construction Programme - Part III: Submarines, 3 and 8.'
See also: Appendix: G(4).

it was considered necessary to state that the British submarine was not to be viewed as primarily a commerce raider. 'No mention is made of the destruction of enemy trade as the primary function of British submarines as, apart from the limitations imposed by the Root Resolutions, it is only in exceptional cases that this function cannot be more effectively carried out by surface vessels.'[19] There seems little doubt that the documents forwarded to the Cabinet were intended not only to be used in support of an enhanced construction programme but also as a case for the retention and strengthening of the submarine forces within the Royal Navy.

The Admiralty emphasised two factors. Development of the Asdic device, in Britain, was considered to be far ahead of anything possessed by any other Power. Therefore, while enemy submarine forces would be faced with gradually more efficient A/S forces, the British submarine was expected to remain relatively immune to detection. This was considered to be extremely important in roles such as reconnaissance. 'The development of submarine detecting devices will have a limited effect on the usefulness of submarines.'[20] However, the Admiralty case was weakened by the admission that the 'limited effect' would be achieved by simply withdrawing the submarine outside the range of coastal A/S vessels. In military terms this was clearly an unsatisfactory policy, given the high priority accorded to information gathering. Those of a cynical nature might have been tempted to view the Admiralty's solution, of expanding the number of submarines on reconnaissance duties to cover the same area, as merely an excuse to justify their case for increased numbers.

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19. Ibid.

20. ADM 1/8072/230, 'Ten Year Construction Programme.' (See Note 18.)

The Admiralty's attitude to the reconnaissance role also appeared confused. The suggested use of surface or semi-surface support (cruiser submarines) for submarine reconnaissance forces appears to destroy the advantage of 'invisibility' conferred by submergence. Moreover, this was a very expensive way of providing support and could only result in drawing enemy surface forces to the area. Nevertheless, the chance of tempting enemy units on to major British surface forces was the policy which was advocated to justify a persistence with submarine reconnaissance patrols in areas of intense A/S activity. It could also be seen as an excuse for justifying the construction of the cruiser submarine. But if support for submarine forces were to be provided to destroy major enemy surface units then surface cruisers would have been a more realistic proposal; and if the scenario was ever actually considered for practical use, the growing effectiveness of maritime air power was to nullify any possibility long before the opportunity arose to use it. However, such schemes were symptomatic of the thought and energy applied to the task of retaining and developing the submarine within the Royal Navy when wartime experiences, government policy and finance all were weighted against this category of vessel.

Submarines in service with the Royal Navy in 1924 were all of wartime construction and this factor was calculated to reduce their effective operational life to ten years. Advances in design, construction and maintenance were expected to increase the service life of new submarines to fifteen years under peacetime conditions. The recommended proposal was that,

> 'for the first year under consideration, 1925-26, eight oversea Patrol type should be laid down; and that in each subsequent year the question should be decided whether one or two of the eight should be cruiser submarines, aiming at a total

> 'of twelve of the Cruiser type in each period of ten years: or whether a group of four Fleet submarines and four of the oversea Patrol type should be constructed.'[21]

It was still hoped that construction of cruiser submarines could begin in 1926-27 and the first of the new fleet submarines in 1927-28.

The Admiralty had hoped for an immediate Government decision but this was not to be. Despite continuous pressure there was no progress until early in 1925. Opposition to any increase in expenditure at all was led by the Chancellor of the Exchequer, Winston Churchill.[22] Expenditure on all three Services was to drop steadily throughout the 1920's and: 'If Churchill had had his way completely, the drop would have been even more sharp.'[23] Churchill favoured no new construction in 1925-26 with the exception of submarines, mainly because they required only relatively small expenditure. This attitude, allied to the belief that there was a negligible threat from Japan, was bitterly fought by the Admiralty, and led to the setting up of the Naval Programme Committee chaired by Lord Birkenhead.[24]

The Committee asked the Admiralty to submit a modified construction programme, which was handed over in June 1925.[25] The decision to agree to this request resulted partly from the Admiralty's awareness of the necessity for an alteration of ground, because of prevailing domestic

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21. First Lord of the Admiralty, W.C. Bridgeman to Naval Programme Committee of the Cabinet, 18 June 1925, ADM 116/3441, 'Modified Naval Construction Programme.'

22. R. Rhodes James, Churchill - A Study in Failure, 1900-39 (London, 1973), 214.

23. R. Rhodes James, 215.

24. Naval Programme Committee of the Cabinet, 18 Feb. 1925, ADM 116/3441, 'Composition and Terms of Reference: Part III of Admiralty Memorandum on Ten Year Construction Programme - Submarines.'

25. R. Rhodes James, op. cit., 215.

political and economic factors, and to prevent the total rejection of the Ten Year Programme. Although the appointment of the Committee was in some ways a victory for the Navy - their proposals were not rejected out of hand, it was clear that they would have to provide a convincing brief to maintain this partial success against the Chancellor's preferred policies. However, it was made clear that in the event of rejection of the modified proposals the entire Board of Admiralty were prepared to resign.[26] The Government seemed determined, for economic reasons, to downgrade the danger of the naval situation outside Europe, even to the extent of reversing the decision reached by the naval planners in August 1924 and confirmed by the Board in September 1924 that, 'no reason exists for changing the basis on which naval preparations are being made i.e. War in the Far East. This is probably the most difficult war we may be called upon to engage in and, for this reason, it is considered desirable to pursue our preparations in that direction.'[27] By June 1925 this had become: 'the Admiralty are to be guided in their preparation by the view of the Cabinet that aggressive action against the British Empire on the part of Japan within the next ten years is not seriously to be apprehended.'[28] The Admiralty were to be compensated for this disruption to existing plans by being allowed an extended period of time for completing war preparations, from 1929 to 1935, but there seems to have been no realisation of the time that would be necessary to rectify any deficiencies if a threat were to arise in the Far East after the suggested time period elapsed.

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26. R. Rhodes James, op. cit., 214.

27. D. of P., 25 Aug. 1924, ADM 1/8664/133.

28. Naval Programme of the Cabinet, 1 July 1925, ADM 116/3441, 8th Meeting, 'Modified Naval Construction Programme.'

Admiralty proposals for modifications in the submarine category extended at this stage only to models rather than numbers. Future annual construction was requested to be at a level of eight patrol submarines, except for 1928-29 when only seven were to be ordered plus one fleet boat.[29] Further requests for reductions in the overall construction programme to reduce the annual cost of all naval construction to approximately £13½ million led to a cut of two patrol models per year. Despite vigorous leadership from the First Lord, it was clear that the Admiralty representatives would have a hard fight to secure acceptance of even the modified proposals. Churchill was strongly opposed to the total numbers requested by the Admiralty for the Ten Year Programme. The Chancellor was determined to reduce spending on defence and had already secured an extension to the life of the 'Ten Year Rule'. Now he made no effort to disguise his scepticism on the need for the proposed number of submarines. Keyes, in order to counter this attack, painstakingly pointed out that the total required was based on contingency war plans in the event of conflict with either France or Japan. There was some scepticism expressed at the figure of 80 submarines being achieved coincidently for confrontations with both France and Japan. However, Keyes's explanations were apparently accepted.

Strenuous questioning then took place on the need for the various submarine models requested by the Admiralty. On the cruiser submarine the Admiralty indicated that one of the proposals for any future naval disarmament conference should concern qualitative tonnage limitation. If successful, it was hoped that this policy would prevent the general construction of such large submarines. Naval opinion now tended to consider them as a potentially serious threat to Britain's maritime trade. Disenchantment with the cruiser submarine also stemmed from the calculation that

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29. See Appendix: G(5).

in order to concentrate on building patrol submarines it would be impossible to match any potential enemy in constructing the cruiser model. More importantly, the proposal for qualitative limitation marked an alteration away from a total demand for abolition in terms of international naval disarmament. The attitude towards the fleet submarine however remained unchanged and still depended on the production of a sufficiently powerful diesel engine.

The Committee was fascinated with the proposed use of submarines in any conflict with Japan and the immense distances involved. However, whether any future war was in the Far East or Europe, the probably British submarine force was likely to be based largely on the patrol submarine, with construction being concentrated entirely on the 'O' class. However, this design would be fourteen years old by the time the Ten Year Programme was completed in 1937, and to remain with the one design was to ignore the question and value of development. Nevertheless, although there was no evidence that the Admiralty favoured allocating only minimal resources to submarine development, less funds were being channelled into this category of research and development than any other. In addition, submarine development had been so neglected that the facilities for construction had almost disappeared; a point emphasised by Admiral Fuller.[30]

> 'The submarine building is a very specialised construction, and if we do not keep to a sort of programme from the point of view of construction work, we will not have the people to construct them when we want them ... there is only one firm that has kept going since the war, and they have been able to do so because they

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30. Fuller, Sir Cyril Thomas Moulden (1874-1942), Admiral; b. 22 May 1874; D. of P., Jan 1918 (Peace Conference, 1919); Rear-Admiral, June 1921; A.C.N.S., 1 Dec. 1922 - 15 May 1923; Third Sea Lord and Controller, 15 May 1923 - 30 Apr. 1925; Vice-Admiral, July 1926; C. in C. North American and West Indies, Apr. 1928; Admiral, May 1930; Second Sea Lord, 26 May 1930 - 31 Aug. 1932; ret. 1935; d. 1 Feb. 1942.

> 'were building a submarine engine to put into a ship for trial. The other firms have practically dropped the whole thing. Some of them say they can start again but it will take a long time. They could get going in a year probably.'[31]

On this point, even Churchill was prepared to concede that some submarine construction was necessary.

On requirements to fulfil contingency plans against France, the Admiralty held that submarines would be needed mainly for reconnaissance off the French ports. This reasoning, accepted by the Committee, was based on the belief that French submarines would prevent surface ships fulfilling this role. However, the question of the number of boats required to counter the French revolved around whether the British submarines would be used entirely on reconnaissance, in which case 80 boats was considered too high a requirement, or also on blockade duties. Therefore, before approval could be given to a total of 80, the Admiralty was required to furnish supporting evidence based on the War Plans. Meanwhile, the discussion touched on the efficiency of Asdic. Keyes was quick to counter Churchill's arguments by pointing out that detection was only the easier half of the problem since the submarine still had to be destroyed. On the proposed total, Churchill was at pains to emphasise that he was not against a continuance of submarine construction but he considered a figure of 80 boats as excessive. A far more practical programme would be to build only three to four submarines annually for five years and then see how the international situation affected development. Although a sound idea it was not necessarily advanced for the right reasons, which should have been based not only on cost but also on the need to incorporate new design and construction developments into the Ten Year Programme. An alternative

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31. Fuller to Naval Programme Committee of the Cabinet, 23 Mar. 1925, ADM 116/3441, '5th Meeting.'

suggestion was made that if a deficiency in submarine numbers arose an emergency programme should be resorted to. However, this would have been based solely upon existing designs and allowed no inclusion of development work.

In reaching a conclusion on the size of the long-term construction programme, the Cabinet, through its Committee, had before it additional information concerning Britain's shipbuilding capacity in the event of war.[32] If the possibility of war with either Japan or France in 1929 were accepted for planning purposes, then it was accepted that there would be a need to lay down an extensive construction programme including provision for 45 submarines. However, this was well beyond Britain's shipbuilding capacity. Within the 1935 framework, as the Admiralty had intended it to be read, the Ten Year Programme could still go ahead but in the submarine category sixteen boats would be needed annually, and 32 slipways permanently occupied by new construction, to replace war losses calculated as being twice the annual peace-time level. The problem was that the maximum submarine construction programme possible on the outbreak of war was assessed at only 32 boats.

Nevertheless, the Government decided to postpone any new submarine construction for one year and from 1926-27 to authorise only six patrol models annually plus one fleet submarine in 1929-30.[33] The initial effect of removal of the six submarines, plus a depot ship and a repair vessel, was to save only £754,657 out of a total cost for 1925-26 of £8,928,827.

The 1925-26 programme was to be confined to, 'the completion of "L.26"

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32. Plans Division, 8 May 1925, ADM 116/3747, 'Shipbuilding Policy in War.'

33. Bridgeman, 27 July 1925, ADM 116/3441, 'Statement on the 1925-26 Naval Estimates - Supplementary Programme.' (Cmd. 2476.)

'and "L.27", and further advancement of "0.1".'[34] This decision did not please the Admiralty.

> 'With reference to the Cabinet decision postponing for one year the proposals of the Admiralty for the construction of submarines, the Sea Lords desire to place on record the situation in regard to this type of vessel ... The British Empire will in 1929 be inferior to the U.S.A., Japan and France in <u>total numbers of Submarines</u> and, in vessels of post-war design, will have only four as against the 37 possessed by the U.S.A., 61 by Japan, 67 by France and 20 by Italy.'[35]

The five year lead held by Britain in 1919 would no longer exist and with the possibility of another international naval disarmament conference in the near future, the outlook for the submarine in the Royal Navy looked very gloomy. Although the struggle over the Ten Year Programme had resulted in a commitment to continue submarine construction there were to be no increased resources for development. This position existed largely because the Government, despite Admiral Beatty's warning, remained not only averse to development and expansion but also continued to seek international agreement on abolition. However, experience as evidenced by: 'The proceedings of the Washington Conference clearly demonstrated that any proposal for the total abolition of submarines would not have the slightest chance of acceptance.'[36] Proposals on tonnage limitation were indicated as probably being more acceptable and the possibility of agreement on qualitative limitation was certainly welcomed. The Admiralty disapproved of continued pressure towards achieving abolition largely because it was

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34. Bridgeman, July 1925, ADM 116/3706, 'Statement on the 1925 Navy Estimates.' (Cmd. 2366.)

35. First Sea Lord, Admiral Sir David Beatty, 23 July 1925, ADM 116/3387, 'Statement on New Construction Programme.'

36. D. of P., 13 Feb. 1925, ADM 1/8683/131, 'Naval Disarmament - Views 1925.'

realised that, 'the chances of abolishing submarine warfare are not great, as all the smaller powers consider that the submarine is their main Naval weapon of defence.'[37] Greater faith was placed in achieving sufficient reductions to allow financial savings in the provision of peace-time A/S forces. This had emerged as a strong point of the British case at Washington and now continued to hold a pre-eminent position in the disarmament conference proposals. Money saved in this sector was considered invaluable as a means of reinforcing the strength of major surface units.

Although the 1925 Naval Disarmament Conference proved still-born, pressure on the Admiralty for further economies increased in severity. However, as the Government had confirmed definite construction programmes up to 1931, the Admiralty could be forgiven for thinking that the construction issue had been settled. Nevertheless, following upon the report of the Cabinet Naval Programme Committee, it was decided to set up the Colwyn Committee, to re-evaluate the strength of shipbuilding in the event of war. The Birkenhead Committee had calculated the minimum number of slipways necessary for 1929 to meet the required total of warships to be laid down in the first year of war. The inability to meet this shipbuilding capacity necessitated a postponement of the theoretical date of war to 1935. It was hoped that normal construction would then have reduced the number of warships required on the outbreak of war. The Admiralty, having already fought a long struggle to obtain some form of future construction programme, were in no mood to enter a fresh conflict over another ten year programme.

> 'We do not know and cannot forecast what the strength of fleets in 1935 will be. Even in the case of the British Fleet we only know what the strength will be in 1932. Further it is

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37. Admiralty to Committee of Imperial Defence, 9 Oct. 1925, ADM 1/8683/131, 'Views of Board on Naval Disarmament.'

'suggested that it is very undesirable to re-open the question of British Shipbuilding policy with Lord Colwyn's Committee as that would necessitate going over the whole of the arguments ... which were put before Lord Birkenhead's Committee ... Their Lordships assume that it is not the desire of Lord Colwyn (even if it were within his province) that the Admiralty should re-open the arguments in favour of their original proposals for new construction, which were put before and considered by Lord Birkenhead's Committee. As the Committee are aware, the Government have quite recently decided on a certain scale of ship construction for five years after full consideration of the recommendations of this Committee and it is presumed that this decision is not in question.'[38]

There the situation was allowed to rest for the moment, although the Admiralty took the opportunity to re-emphasise the fact that existing plans allowed for only 28 new submarines by 1929, compared with 53 in the United States Navy and 71 in the Japanese Navy.

This was calculated as leaving a deficiency, under the Washington Naval Treaty, of 35 under-age submarines by 1 April 1932. Therefore, the Cabinet's total for a replacement programme was considered to fall,

'far short of the appropriate quota of the full ten years' programme originally asked for by the Admiralty. Unless, therefore, the consequent deficiency is made up by a greatly increased programme in the years immediately following the now approved programme the strength of the Fleet in 1935 will be far below a real one-power standard as this term is conceived by the other principal Naval Powers.'[39]

Moreover, the Fleet was expected to be limited in efficiency, since in conforming to the Government's policy the Admiralty were having to resort to extreme measures to achieve reductions. Further, this contraction of numbers and strength could only be achieved: 'By the acceptance of risks

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38. D. of P. to Colwyn Committee, 27 Oct. 1925, ADM 1/8692/253.

39. D. of P. to Colwyn Committee, 26 Oct. 1925, ADM 1/8692/253.

'which would in normal circumstances be guarded against as an essential feature of naval policy, and by making changes which in several instances are in the nature of experiments and may not ultimately prove practicable.'[40] Although there was acceptance of the political ruling on the question of war up to 1935, scepticism existed on the wisdom of such a decision. 'As regards material the Admiralty policy is to provide equipment only for vessels that will be in the Fleet at the end of the ten year period, during which the Cabinet have stated it is unlikely any war will occur, and to spread this accumulation evenly over the ten years.'[41] Thus, if the Cabinet's ruling was accurate there would be little need for a Navy for at least ten years and therefore expenditure could be reduced by curtailing construction and replenishment for this period. Admiralty planning accepted that by 1931 the Atlantic Fleet would, 'have become relatively unimportant as compared with the Mediterranean,'[42] and reflected the reorientation of the Royal Navy to face the potential naval threat in the Far East. Concentration of British naval forces in the Mediterranean served two purposes necessitated by the inability to maintain a large battlefleet both in Home Waters and the Far East. Primarily, the security of the sea route through to the Suez Canal was ensured if it proved necessary to move the main Fleet and troop convoys to the Far East. Moreover, in the event of any deterioration of the situation in European waters it would be possible for the Mediterranean Fleet to reinforce the Atlantic Fleet. However, it was clearly not possible to reinforce both areas simultaneously.

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40. Ibid.

41. ADM 1/8692/253, D. of P. to Colwyn Committee. (See Note 39.)

42. Head of Mining, 15 July 1926, ADM 1/8701/143.

British submarine forces were also affected by the proposed reorganisation and the calculation was that by 1930 one third of the available boats would be assigned to the China Station (twelve '0' and nine 'L'). Originally six '0' class had been earmarked for the Mediterranean but these were replaced by 'K.26' and five 'L' class,[43] and in 1929 units of the 'P' class were also earmarked for the Far East.[44] At home the problem of submarine numbers was most evident in meeting training requirements. The shortage of strength had already led to the decision to merge the Devonport and Atlantic Fleet flotillas. The Atlantic Fleet wanted them not only for patrol and reconnaissance work but also to simulate roles of the fleet submarine. Devonport's claim was based on the need for as many training submarines as possible in a situation where shortage of hulls was so desperate that at Portsmouth submarines were having to be brought out of reserve to augment the training squadrons.

Meanwhile, the question of further reductions in submarine strength was also affected by moves towards a new naval disarmament conference. However, until agreement was reached in either abolition or limitation, the Admiralty had to wrestle with the problem of inadequate numbers. The latest proposals had been proclaimed as helping, 'to reduce materially the cost and maintenance of submarines.'[45] The indication was that the Admiralty now based any long-term judgements on submarine policy more upon economic factors rather than any political solutions likely to result from disarmament conferences, or upon any military judgements. This led to a revision

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43. Admiralty to C. in C. Mediterranean Fleet, Admiral Sir Roger J.B. Keyes, 10 Feb. 1926, ADM 1/8715/185, 'Future Disposition of Submarine Flotillas.'

44. Admiralty, 1929, ADM 116/3706, 'Naval Estimates.'

45. Head of Mining, 28 Mar. 1927, ADM 1/8715/185.

in acceptable numbers: a total of 66 instead of 71 submarines would be required from 1933 onwards. Estimates of the service life of existing submarines were extended to twelve years, for wartime construction, and fifteen years for peace-time construction. Future submarine building programmes were confirmed at a maximum annual rate of six boats between 1929 and 1932, while the inclusion of a fleet model in the 1929 programme was rejected in favour of a slower design (21 knots) known as a 'fast patrol' submarine. However, a new design for a small patrol submarine ('S' class) was added to the same programme in order to replace the over-age 'H' class. Despite this, it was proposed that from 1930 onwards only four submarines should be constructed annually: although it was disguised as a minimum programme, numbers would not increase since the scrapping schedules was set at four boats per annum from 1933. The guiding criteria had to ensure that: 'The new scheme will involve less expenditure than the old.'[46] However, these criteria were denounced as mere supposition as it was pointed out that:

> 'The question of the number of Submarines to be maintained in the ultimate war Fleet will be one of the points at issue at the forthcoming Naval Conference at Geneva. Similarly there is no doubt that the life of each type of ship will be considered and, it is to be fixed. On the results of the Conference, therefore, will depend the distributions, construction and replacement of Submarines after the year 1932,' but, 'for the whole period under review in the distribution,' 1927-32, 'put forward by Director of Plans it will be necessary to replace our old submarine construction, irrespective of any agreement which can be envisaged as resulting from the Naval Disarmament Conference.'[47]

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46. Ibid.

47. D.C.N.S., Vice-Admiral Sir Frederick L. Field, 5 Apr. 1927, ADM 1/8715/185.

Tripartite Geneva Naval Conference of 1927 - Preliminary Discussions

Efforts to achieve a new agreement on naval limitation had been encouraged by the success of the Locarno Pact which had heralded further Allied withdrawals from Germany and her admittance to the League of Nations. The resulting international situation was now judged suitable for further moves on disarmament and plans were outlined setting up a Preparatory Commission for a disarmament conference to be held at Geneva during 1927. The United States Government was anxious to extend such a conference to include naval disarmament and during February 1927 discussions were held between American and British representatives. The United States proposal was for, 'a further conference, confined to the Washington Powers, for the extension of the principles of the Washington Convention to classes of vessels other than those affected by that Convention.'[48]

The First Lord had already indicated a favourable view towards a naval conference,[49] and the Americans considered that their policy conformed with British wishes on this subject.[50] However, the British held that because of the failure to secure acceptance of the Washington Treaty by the smaller Powers, it might be dangerous to proceed to further naval reductions. There was the strong possibility that the only reciprocal reductions would come from the Washington Treaty Powers. Internationally, the United States Government had, 'little to gain from the success of a general disarmament,' but, 'much to gain from a naval conference, whatever the measure of its success.'[51] Further, with elections due in the

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48. Foreign Office, 11 Feb. 1927, Documents on British Foreign Policy, (London, 1970), 1a ser., III, 566.

49. Bridgeman, June - Aug. 1927, Cmd. 2964, 'Speeches at the Plenary Session of the Geneva Conference.'

50. Foreign Office, 10 Feb. 1927, D.B.F.P., 1a ser., III, 565.

51. Foreign Office, 12 Feb. 1927, D.B.F.P., 1a ser., III, 568-71.

United States:

> 'The Republicans' electioneering cupboard is bare, and the President must shortly reach a decision in the matter of cruiser construction. To build or not to build is becoming the burning question of the hour, and will have an important effect on the party's prospects.'[52]

The Admiralty remained hostile to any reduction in surface cruisers below existing or projected numbers, since this was seen as imperilling the safety of Imperial sea communications. The cruiser issue was expected to be the major question at the naval conference but the Admiralty would not accept a reduction in numbers coupled with the extension of the 5:5:3 battleship ratio to the cruiser category, even if there were prospects of limitation agreements on the submarine category as a result. Divorced from any agreement on cruiser ratios, 'they would welcome some limitation of submarines.'[53] However, it was accepted that:

> 'The Americans, who are weak in cruisers, would bring the utmost pressure to bear on us in that category, for, if we persisted in our refusal to reduce, irrespective of ratio, the conference would surely collapse. After Cruisers, the conference is no doubt aimed at submarines. The French attitude towards that class is well known. They have consistently refused to entertain any kind of limitation ... They would, of course, be in a strong position to maintain that attitude in the absence of agreement on cruisers. In the event, on the other hand, of agreement in that class, they would be hard put to it to resist the pressure of the other conference Powers and of Public opinion at large which, in the matter of submarines, has further hardened since the days of Washington.'[54]

The last two points appear to have been optimistic, especially the reference to the power of public opinion, which had proved inconclusive at the 1922

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52. Ibid.

53. D. of P., 9 Mar. 1927, ADM 1/8715/185, 'Memo on Board Minute No. 2285 of 27 Jan. 1927.'

54. Ibid.

Washington Conference. However, what could not be denied was the truth of the statement that, 'the present chance is as good a one as we may get for many a day of securing a limitation of submarines,' and, 'that is, of course, if the French could be induced to enter a separate naval conference at all.'[55]

Geneva Naval Conference 1927 - Submarine Policy

British policy for Geneva was defined as being, 'to obtain by common consent the total abolition of the Submarine or, in default, a strict limitation in the tonnage allowed to nations.'[56] In attempting to achieve this, recognition was given to the necessity of securing the acceptance, by the other naval Powers, of the belief that Britain no longer regarded the submarine as a military threat. However, this was a reversal of the attitude which presented the submarine as being capable of doing, 'great harm to an opposing Power, irrespective of that opposing Power's naval strength.'[57] Therefore, a reason was necessary to explain this change and the chosen solution was to present the latest Asdic developments as the complete antidote to the submarine. However, this still left two problems: the efficiency of Asdic and the question of the need to maintain a degree of secrecy about it. British research suggested that the complete A/S solution had still not been developed but a device such as Asdic, 'in combination with depth charge attack, renders the detection and subsequent hunting of a Submarine a comparatively easy operation while rendering the chances of a successful attack by Submarines correspondingly more remote.'[58]

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55. D.B.F.P., 1a ser., III, 568-71. (See Note 51.)

56. D. of P., 3 Mar. 1927, ADM 1/8715/194, 'Limitation of Armaments - Submarines.'

57. Ibid.

58. ADM 1/8715/194, 'Limitation of Armaments.' (See Note 56.)

However, the belief in detection as 'a comparatively easy operation' must be questioned when the poor results achieved by the A/S training squadrons were attributed to the fact that 'our own submarines have become skilful in "avoiding" tactics.'[59] The official view of the efficiency of Asdic was also questioned, especially by submariners.

> 'Asdic was never the infallible weapon we cracked it up to be ... In various set-piece exercises, we dived and asdic-fitted ships hunted us. To facilitate their training and strengthen their confidence our movements were generally restricted; seldom were we allowed to evade. When evasion was allowed, we generally succeeded ... On other occasions, in Fleet exercises, we submarines carried out many dummy attacks on battleship steaming at 18 knots, zig-zagging, with anti-submarine destroyer screens. Our movements were, of course, unrestricted, but even then everyone above the surface knew that a succession of submarines would be attacking between certain times in a particular area. But still, an average submarine stood an odds-on chance of getting in close enough to fire torpedoes undetected.'[60]

Opinions were divided between the merits of 'leaking' information on Asdic, even in the interests of achieving abolition. It was considered that a 'leakage' followed by vague Parliamentary questions and answers, would mean that, 'the atmosphere in June next in regard to Submarines will be more favourable to British Policy.'[61] This was concurred in mainly because, 'once an apparatus is largely fitted at sea, it cannot be kept secret.'[62] Additionally,

> 'other nations are convinced that the British desire for the total abolition of submarines

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59. D.S.D., A.E. Kennedy-Purvis, 8 Mar. 1927, ADM 1/8715/194.

60. J. Broome, Convoy is to Scatter, (London, 1972), 79-80.

61. ADM 1/8715/194, 'Limitation of Armaments.' (See Note 56.)

62. ADM 1/8715/194, D.S.D. (See Note 59.)

'is based not on humanitarian grounds, but on the undoubted fact that Great Britain has more to fear from submarines than has any other Power. If the veil of secrecy regarding Asdics be partially lifted at the present moment, foreign Powers are almost certain to assume that it is being lifted solely for the purpose of helping Great Britain in the presentation of her case against submarines.'[63]

Major opposition to abolition was again expected to come from the French; therefore: 'To expect (France) to agree to the scrapping of all these new submarines, on which she has expended so much money since the war ... and by means of which she has attained naval superiority over her potential enemy, Italy, seems Utopia.'[64] France was known to have conducted Asdic experiments and Japan and Italy were expected to follow suit. Therefore, the probability was that Britain would lose rather than gain by an disclosures about Asdic developments; and although work on Asdic could continue, even in the unlikely event that abolition was achieved, it would soon prove impossible to continue the study of A/S techniques without the use of submarines as targets. If a major Power resumed submarine building then British A/S forces would be at a disadvantage. These facts led to the conclusion that, 'we should guard the secrets of our attainments in anti-submarine warfare ... so that we may maintain the lead we possess over other Navies at the present time.'[65]

Meanwhile, the Government had reaffirmed Britain's intention to participate in the proposed naval conference, although now both France and Italy were averse to the idea,[66] and final invitations were issued for

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63. D.N.I., 21 Mar. 1927, ADM 1/8715/194.

64. Ibid.

65. ADM 1/8715/194, D.N.I. (See Note 63.)

66. Sir W. Tyrrell (Foreign Office) to Sir E. Howard (Washington), 8 Mar. 1927, D.B.F.P., 1a ser., III, 581.

a three Power conference following favourable indications from the Japanese. The absence of France from the Geneva Conference led to a revision of Admiralty policy which restricted objectives in the submarine category to tonnage limitation since any possible agreement on abolition would be worthless. Ideally, submarine totals would not be discussed at all since: 'So long as the Submarine is dealt with as a distinctive type of vessel it appears impossible to formulate any basis on which to allocate numbers and an empirical allocation would appear to be the only practical solution.'[67] Each nation had different operational reasons for arriving at the total tonnage it required. As a means of achieving limitation by the other major naval Powers, it was proposed that Britain should insist on the submarine not being treated as a distinctive type of vessel but merely a special version of surface warships. Thus,

> 'the British "M" class are Capital Ships by virtue of their 12 inch gun armament; "X.1" is a Cruiser, while the "O" class are torpedo-carrying vessels. If this general proposition can be accepted the solution would appear to lie in permitting submersible vessels to be built out of and only out of the number of warships allocated to the Powers of the distinctive types ... Thus, if a nation should desire to build a submersible vessel carrying a 12 inch gun, she would have to sacrifice her right to build a surface Capital Ship.'[68]

This was undoubtedly ingenious but an illogical scheme and was unlikely to be considered as a practical proposition.

Final British Proposals - Submarines

Although publicly committed to press for abolition, the Admiralty decided at an early stage to base British submarine proposals on tonnage limitation so as, 'to see limitations imposed on the numbers, size and

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67. D. of P., 10 Mar. 1927, ADM 116/3371.

68. Ibid.

'armament of submarines.'[69] The British argument on qualitative limitation reaffirmed a belief that: 'If ... the submarine is a necessity for defence, the larger type of vessel is not essential for this purpose.'[70] Proposals were that within the overall tonnage allocation there should be two types of submarine: Class A (1,600 - 2,000 tons: 5 inch gun) and Class B (under 600 tons: 5 inch gun) with the age limit of both set at fifteen years. These types represented standard British naval thinking on their own requirements and also on restricting the operating efficiency of the submarine in an anti-commerce role. These proposals were regarded as the nearest alternative to total abolition and an improvement on the policy of having an overall tonnage limit alone, which allowed a country to build submarines of any size, provided that they did not exceed the overall quota. Subject to equivalent reductions by the other participating Powers, Britain was prepared to accept a limit of 60 submarines. Further, if the United States and Japan were to lay claim to a higher number then the intention was to adopt an equivalent position on numbers of surface cruisers.

Tripartite Naval Conference - Geneva 1927

The Conference opened on 20 June attended by delegations from the United States, the British Empire, and Japan. France and Italy had refused to participate but the former sent an 'informer' and the latter an 'observer'.[71] Although capital ship and cruiser ratios were the major

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69. Plans Division, 6 May 1927, ADM 1/8715/188, 'Proposals of 1927 Naval Disarmament Conference.'
See also: Naval Staff, ADM 1/8715/188, P.D. 02852/27.
See also: C.I.D. Paper No. 808B, 14 April 1927.

70. Ibid.

71. 'The Naval Conference,' R.U.S.I. Journal, LXXII (1927), 633.
See also: S.R. Graham (Rome) to Sir A. Chamberlain (Foreign Secretary), 3 Mar. 1927, D.B.F.P., 1a ser., III, 578.

considerations of the Conference, the British delegation[72] were prime advocates of discussions on the submarine category. The United States proposed that total submarine tonnage be based on the existing Washington ratios for capital ships of 5:5:3 for themselves, Britain, and Japan respectively. Age limit was to be set at thirteen years. The Japanese favoured a virtual cessation of naval building and coupled this with a demand for a higher ratio in all categories for themselves.[73] Neither of these Powers favoured qualitative limitation. The British regarded such proposals as, 'perpetuating competitive building.'[74] The Americans were not specific on quantitative submarine limitation and figures as varied as 60,000 to 90,000 tons were mentioned. However, by 24 June a sufficient degree of agreement had been reached to allow the submarine category to be discussed by the Technical Committee. The Japanese now accepted the concept of two classes of submarine, if only as a basis for discussion, while the British wanted a total tonnage for each class[75] and considered maximum and minimum displacements as a way to, 'cut out the chance of any Power building a large number of medium size submarines of, say, 1,000 tons, which possibility would otherwise have existed under a total tonnage system.'[76] Despite this, the Americans, upon being informed of the British requirements for only fifteen small and 45 large submarines, had agreed to the proposals provided they were given equality. There was, as the D.C.N.S. pointed out,

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72. First Lord of the Admiralty, W.C. Bridgeman; Chancellor of the Duchy, Viscount Cecil of Chelwood; D.C.N.S., Vice-Admiral Sir Frederick L. Field.

73. British Empire Delegation, 21 June 1927, ADM 116/2609, '2nd Meeting.'

74. Mr. London (Geneva) to Chamberlain, 21 June 1927, D.B.F.P., 1a ser., III, 608-09.

75. Bridgeman to Baldwin, 27 June 1927, D.B.F.P., 1a ser., III, 623.

76. British Empire Delegation, 24 June 1927, ADM 116/2609, '3rd Meeting.'

no objection to this and such a concession might be useful since,

> 'it must be remembered we had come to this Conference suggesting that each country should state what they required in various classes of ships and that they should each state their case justifying these requirements. When we come to state that our requirements in cruisers would be approximately 500,000 tons, the Americans, if they still demanded equality, would have to justify an increase in their demands from the 300,000 of their proposals to 500,000.'[77]

This was a crucial aspect of the Conference since the British were not treating the question of agreement on submarine policy as an isolated case but one which might be useful in modifying American demands on other categories. Indications were given that they would adopt a more flexible attitude over submarine tonnage if the Americans adopted a similar position on cruisers. However, this presumed a general consensus among the three Powers to achieve some form of successful conclusion to the Conference. Moreover, United States policy, as Viscount Chelwood pointed out, was based on ensuring that the results of the Conference should be two fold: to keep the Japanese allowance as low as possible and to achieve naval equality with Britain. Further discussions on the submarine category were delayed while the Japanese delegation awaited instructions from Tokyo on whether or not to exclude the small submarine category.[78] Despite a negative decision on Class B the submarine discussions continued, albeit slowly, with both the Americans and the Japanese, in the British view, proving difficult. 'The Japanese were adamant in insisting on 2,000 tons for the bigger type submarines. The Americans, however, were prepared to come down to something nearer our own figure.'[79] However, even this possibility

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77. Ibid.

78. British Empire Delegation, 29 June 1927, ADM 116/2609, '4th Meeting.'

79. British Empire Delegation, 1 July 1927, ADM 116/2609, '5th Meeting.'

brought no real satisfaction; Admiral Field found the Americans very trying to deal with. 'He thought he had got them to agree to something and at the next meeting he found that they simply reverted to their own original proposal.'[80] The American attitude seemed to be one of playing for time and on 1 July they repeated the same tactics on submarines, 'in regard to which a considerable measure of agreement had previously been reached.'[81] The British considered 1,600 tons as an adequate upper limit for ocean-going submarines, with the operating radius on this tonnage estimated at 10,000 miles. 'The Americans had agreed to a limit of 1,700 tons and,' Admiral Field, '... thought that pressure should be put on the Japanese to do the same.'[82] The Japanese might give way on qualitative tonnage of the small submarine, 'and so facilitate discussions of the submarine class as a whole.'[83] In the absence of agreement by the other two Powers, the British contemplated insisting on nothing less than the 5:5:3 ratio, in line with the original United States proposal, and increasing tonnage requirements from 60,000 to 116,000 tons.[84]

On the evidence of known British views on submarine abolition or limitation, this proposal cannot have been intended as a serious threat but rather as a negotiating ploy. Certainly, on the basis of past opposition to French demands for 90,000 tons, it would have been a remarkable

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80. Ibid.

81. ADM 116/2609, British Empire Delegation. (See Note 79.)

82. ADM 116/2609, British Empire Delegation, (See Note 78.)

83. D.B.F.P., 1a ser., III, 623. (See Note 75.)

84. Mr. London (Geneva) to Chamberlain, 1927, D.B.F.P., 1a ser., III, 686-87.

volte-face. Nevertheless, the British delegation went as far as placing on record that the intention to raise the proposed tonnage was, 'largely due to the fact that neither the United States nor the Japanese representatives would agree to submarines being divided into two types and there is therefore no guarantee that the total tonnage finally agreed upon will not be used entirely for constructing submarines of large offensive power.'[85] Unrealistic as this move may have been, it had been largely dictated by two reasons; to attempt an alteration of the United States views on cruiser numbers and also because of an appreciation of the A/S effort required, in numbers and cost, to contain submarines capable of an endurance of several thousand miles. The plans to redeploy the Royal Navy towards the Far East dictated the need for development of long-range submarines and complicated the delegation's problems. However, the United States delegation did not deviate from their original demand for parity with Britain on submarine tonnage and they retained the proposal for a quantitative total of 90,000 tons. Meanwhile, some progress was made with the Japanese who were now prepared to accept a minimum limit of 70,000 tons. The British considered that the Japanese were not competing against them but rather were attempting to safeguard themselves against the United States.[86] Further discussions resulted in the Japanese agreeing to transfer 10,000 tons of their submarine claim to surface categories without any increase in their overall tonnage of 325,000 tons. In response, the British were prepared to reduce their total quota by 50,000 tons to 500,000 tons.[87] However, hopes of

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85. British Empire Delegation, 7 July 1927, ADM 116/2609, '6th Meeting.'

86. Ibid.

87. Mr. London (Geneva) to Chamberlain, 17 July 1927, D.B.F.P., 1a ser., III, 690.

finalising these agreements were crippled by the fact that the submarine category was not the central issue controlling the success or failure of the Conference.

The major difficulty concerned surface cruisers and in particular the British proposal, supported by Japan, for a limit only on the number of 10,000 tons vessels. The United States favoured this type, which were considered suitable for fleet operations, and therefore disagreed with the British proposals. Their preference was for agreement based on a 'global' tonnage covering all types of cruisers since,

> 'the United States government would never agree to limitation in one class of cruiser and not in another and that if the British delegates returned to Geneva with proposals for limitation of 10,000 ton cruisers and freedom of action with regard to smaller cruisers the conference was doomed to failure.'[88]

The British favoured the 6,000 tons cruiser since it was considered invaluable for defence of sea communications against surface raiders. Prospects for a successful outcome to the Conference remained gloomy.

Despite this, the British delegation went ahead with modified proposals on cruisers, destroyers and submarines[89] while the negotiations on capital ships and aircraft-carriers were abandoned as unlikely to achieve results. On submarines, agreement was reached over maximum gun calibre, (5 inches); a qualitative limit of 1,800 tons; a definition of standard tonnage; and a statement that no submarines were to be exempt from any overall tonnage agreement, such as the Japanese proposals for submarines under 700 tons. However, no successful outcome could be reached on the other British proposals nor on the 90,000 tons quantitative limit proposed

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88. Mr. Chilton (Washington) to Chamberlain, 28 July 1927, D.B.F.P., 1a ser., III, 702.

89. Mr. London (Geneva) to Chamberlain, 28 July 1927, B.D.F.P., 1a ser., III, 703.

by the United States. Rejection of the British views on cruisers meant that the Government had to resign itself to the failure of the Geneva Conference, with the exception of a few minor agreements, and both they and the United States Government became locked in a purely propoganda battle to assign blame for the failure. British policy,

> 'vis-a-vis of press and public opinion in the event of a breakdown of the naval conference is to express the great disappointment of His Majesty's Government that they had been unable to achieve reduction in expenditure on naval armaments which they so ardently desire and which their own proposals entailed, owing to rigid adherence of the United States to proposals which place Great Britain in a permanent position of naval inferiority.'[90]

On 3 August, instruction were issued to alter the final passage to read: 'Whilst giving Great Britain and the United States an equal tonnage of cruisers would leave us without a sufficient number of them to protect our sea communications.'[91] Much of the blame for failure was attributed to the Americans because of,

> 'their insistence on building a large number of cruisers with eight inch guns entailing a great increase in armament and cost instead of the reduction in both which we were seeking. Anyone who regards the situation dispassionately and impartially will agree that it would be impossible for His Majesty's Government to agree by treaty to fall below the one Power Standard.'[92]

Amidst the inter-governmental duels the final Plenary Session of the Conference was scheduled for 4 August. The United States favoured merely a formal closing ceremony but did not press the issue.[93] The First Lord,

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90. Chamberlain to Sir E. Howard (Manchester, Mass.), 30 July 1927, D.B.F.P., 1a ser., III, 710.

91. Ibid, Footnote No. 3, F.O. Telegram No. 362.

92. D.B.F.P., 1a ser., III, 710. (See Note 90.)

93. Howard to Chamberlain, 3 Aug. 1927, D.B.F.P., 1a ser., III, 724.

aware of political capital, pressed for explanatory speeches and took this opportunity to voice criticism of the American attitude.

The British considered that there were several reasons for the failure of the Conference, including differing strategic viewpoints, the existence of the 'Big-Navy' pressure group and its effects on the American Congress and delegates. 'I came to the conclusion very early in the proceedings that with the American Delegation dominated as it was by 'Big Navy' Admirals there was no chance of any satisfactory agreement.'[94] In addition, much of the British motivation for agreeing to participate in a naval disarmament conference had stemmed from hope of repeating the Washington Conference, which had been regarded generally as a successful venture. However, as Chamberlain pointed out: 'As to the Naval Conference, this is all now past history.'[95] The Geneva Conference proved inconclusive on submarines partly due to the premature curtailment brought about by disagreements on surface cruisers; many of the proposals affecting the submarine category were still at the negotiating stage when the delegations dispersed.

The period between the Washington and Geneva naval conferences had been one of mixed fortunes for the Admiralty. The need to replace wartime construction and the problems posed by the growth of Japanese naval power were two of the initial problems. The Admiralty recognised the existence of financial restrictions which precluded Government sanction for the full constructional requirement. However, following the implementation of the Washington agreements the Admiralty rightly considered that the Ten Year Programme did not utilise all the constructional resources available.

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94. Howard to Chamberlain, 1 Sept. 1927, D.B.F.P., 1a ser., III, 738.

95. Chamberlain to Sir J. Tilley (Tokyo), 24 Aug. 1927, D.B.F.P., 1a ser., III, 734-36.

Financial factors were allowed to ~~[illegible]~~ dominate Government policy and in the face of a continuing decline in shipbuilding and other defence industries the Government relied on political calculations to satisfy military requirements. Thus, contingency plans to counter possible war in the Far East were altered in time scale from 1929 to 1935, irrespective of whether the Japanese or any other Power would be so considerate as not to launch an attack earlier.

The failure to achieve abolition of the submarine at Washington had ensured the retention of this vessel in the Royal Navy. However, the attitude remained one of tolerance rather than enthusiasm, despite the fact that the decline in surface warship numbers resulted in the submarine being recognised as having an essential role in the initial 'holding' stages of a Far Eastern war. Gradually, throughout the period, the combination of political and military requirements with financial factors ensured the prominence of the patrol submarine over the more specialist models; brought about by the need for maximum utilisation of diminishing numbers. Although a plan for submarine construction was agreed to as part of the Ten Year Programme, restriction of the power of foreign submarine forces, even if British submarine requirements suffered, remained the goal of the Government and to a lesser extent the Admiralty. To both, however, a reduction in foreign submarine numbers still meant a possible lessening of the need for A/S escort forces in peacetime, although their reasons differed. The Government considered the logical conclusion to be a reduction in defence expenditure, while the Admiralty saw any diminution of A/S forces releasing resources to other categories. Neither side was prepared to accept the more difficult decision to maintain both submarine and A/S forces. In part this reflected the Government's reluctance to accept the failure of any of the naval disarmament policies. The Admiralty, in turn, preferred to continue pressing for strengthening of the major surface warship

categories rather than make adequate provision for its auxiliary forces. Moreover, in the absence of the French, any submarine agreement was of limited value to the British.

Failure of the Geneva Conference meant that the next three years were to be crucial: Admiralty policy on submarines clearly had to choose between extensive development, for which there seemed no likelihood of adequate resources, or for retention of existing projected force levels. An understanding with the French to reduce their submarine fleet was also considered necessary in the hope that the other major Powers would not follow suit but rather continue to favour tonnage limitation. The Government also favoured reducing the British submarine force in the vain hope that such a gesture would have a reciprocal effect on foreign Powers. Clearly for the Royal Navy generally and the Submarine Service specifically, the late 1920's and early 1930's promised a renewal of the struggle for survival of the British submarine. Although not on the level reminiscent of the pre-Washington period the struggle still centred on the need to retain sufficient numbers to meet operational requirements.

CHAPTER 9

1928 - 1931

ANGLO-FRENCH DISCUSSIONS AND 1930 LONDON NAVAL CONFERENCE

The failure to achieve major agreements at Geneva had little direct effect on existing British plans for submarine development and construction. Decisions on specific models were influenced more by reviews of general naval policy. Thus, in the late 1920's, reviews of the various contingency war plans concluded that war in the Far East was the most likely scenario,[1] and that certain of the resources allocated to submarine development should be moved from the fleet submarine to the patrol model. The increased emphasis on the development of the patrol model coincided, in the period between the 1927 Geneva and 1930 London Naval Conferences, with Admiralty concern over the replacement of ageing First World War submarines as well as the possible effects of international quantitative tonnage agreements.

Intensive studies resulted in total requirements being reduced from 80 to 72 boats with the emphasis on the patrol model. However, with these boats expected to have a Service life of only twelve years, which was a rationalisation stemming from the decisions of the Birkenhead Committee, six new submarines needed to be laid down annually. The submarine provisions of the Ten Year Programme had already been delayed two years and now financial restrictions precluded such an annual construction rate. Proposals for a Service life of fifteen years had been suggested at

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1. D. of P. (W.A. Egerton), Oct. 1925, ADM 116/3629, 'Sketch Estimates 1926 (Vote A): Scheme of Hostilities on which Mobilization Requirements are to be Based.'

Geneva but the United States and Japan had preferred thirteen years. Nevertheless, the question of age limits was not considered likely to, 'affect the problem for another ten or twelve years, when the replacement of the "O" class submarines comes to be considered.'[2] There was also a possibility that production of submarines with increased endurance capabilities would enable a reduction in numbers but this was not considered very likely. In fact, the decline in the numbers of boats ordered was expected to nullify the advantages imparted by increased capabilities. Admiralty policy now aimed, 'at building up to and maintaining approximately 60 - "O" class and twelve - Small submarines whose design,' had, 'not yet been settled.'[3] Moreover, failing any agreement on tonnage limitation the expection was that by April 1931, the Japanese would have 72 submarines under twelve years old and the United States a force of 80 submarines of all ages although this total was expected to decrease in the absence of a new construction programme.[4] British construction policy was dictated by the Government's decision of July 1925 which laid down the building programme up to 1930.[5] This programme had been generally adhered to until the abortive Geneva Conference and the resulting political situation led the Cabinet to set up the Naval Programme Committee. Its brief was to enquire into and seek ways of re-adjusting future construction programmes within the framework of the already announced general policy. Naval planners now regarded war in the Far East as 'probably the most difficult war we may be called upon to engage in.' Therefore, 'the

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2. Plans Division, 29 Aug. 1927, ADM 1/8711/142, 'Shipbuilding Programme 1927: Submarine Position of British Empire in Relation to the U.S.A. and Japan.'

3. Ibid.

4. See Appendix: G(6).

5. See Appendix: G(7).

'decision of the Cabinet to accept the assurance of the Secretary of State for Foreign Affairs that aggressive action on the part of Japan before 1935 is not a contingency to be seriously apprehended,'[6] tended to hamper the Admiralty's plans to prepare a Far East-orientated naval policy. In addition, the continued existence of the 'Ten Year Rule' continued to stifle the speed at which this policy could progress.

An additional problem was posed by the need to replace some of the ageing capital ships. Any improvements to the British submarine force were considered possible only in the period prior to new capital ship construction. One proposal was to increase the annual submarine building rate to eight boats from 1928-30[7] but the Government, still searching for international agreements on disarmament, vetoed any such increase. The same political policies also precluded any immediate capital ship replacement and the Admiralty emphasised that acceptance of Government policy was not to be considered as an endorsement.

> 'It is ... evident that, owing to no building having taken place during the years immediately after the War, even if this minimum programme is carried out, there will be periods when the numbers of these vessels will fall considerably below our bare requirements, except in so far as numbers can be kept up by retaining "over-age" ships if they prove to be efficient enough to warrant retention when the time arrives. The risks resulting from this temporary reduction of strength must however be accepted so long as the chance of an important naval war is remote.'[8]

Although the prevailing doctrine on the threat of naval war identified the Far East as the most likely area this did not totally preclude consideration

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6. ADM 116/3629, '1926 Sketch Estimates.' (See Note 1.)

7. A.C.N.S., 2 Sept. 1927, ADM 116/2606, 'Proposals on Building Programme.'

8. D.C.N.S., Admiral Field to First Sea Lord, Admiral Madden, 4 Oct. 1927, ADM 116/2606.

of involvement in a European conflict. Thus, Navy Estimates down to 1930 were formulated on the basis that they would, 'meet the "war in the Far East" requirements governed by the Ten Year decision, and also the requirements of "an extra European war".'[9] However, if a disproportionate percentage of available resources were allocated to a long-term programme of capital ship replacement, then clearly insufficient numbers of other warships would be produced, and result in an inability to meet even a one-power standard in the general way that the Naval Staff thought right. It was not only the comparative strengths in one or two categories that were important, but the general capacity of the Navy to wage war successfully. The question of balance between categories was considered unavoidable as the period of the building 'holiday' was drawing to a close. Unless this was extended there appeared to be no alternative but to give precedence to capital ship construction. Annual demands by the Government for reductions in the Navy Estimates meant that,

> 'some reduction in the construction of these vessels,' cruisers, destroyers, and submarines, 'will be most strongly pressed on the Admiralty during the years in which the replacement of Capital Ships is necessary. It is therefore most important to increase the numbers during the few years remaining before the construction of Capital Ships commences.'[10]

In November 1927, the Chancellor of the Exchequer, Winston Churchill, pressed for and received Board agreement to cancel two of the three cruisers authorised under the 1927 programme. The Admiralty's reluctant acceptance of this move was largely dictated by the fact that existing expenditure exceeded the Navy Estimates and the only other recourse would have been to

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9. D. of P., 16 Oct. 1927, ADM 116/3629, '1928 Sketch Estimates.'

10. ADM 116/2606, Field to Madden. (See Note 8.)

request a supplementary estimate.[11] Churchill then proposed further reductions in the 1928 cruiser programme and the curtailment or reduction of other naval priorities. The Board opposed this constant whittling away of the ten year programme of 1925.[12] But the final estimate agreed was only just over £1 million more than the total requested by the Chancellor.[13] The surviving two cruisers of the 1928 programme were later cancelled by the incoming Labour Government. Meanwhile, although the Conservative Government would also have preferred international agreement on capital ship limitation, it accepted that the only area in which a possibility of immediate success appeared to exist was in a European agreement on the limitation of submarines.

Admiralty policy still officially proclaimed submarine abolition as their long-term aim but practical realities indicated that tonnage limitation was the best that could be achieved.[14] The need to pursue a policy of submarine limitation was attributed to the submarine threat to the battlefleet and there was only one reference in the Naval Staff appreciation to a threat to maritime trade. This concerned the potential danger of other nations building cruiser submarines. The uneasy balance between abolition and limitation made it difficult, however, either on the one hand to put so much emphasis on abolition that the Government might be tempted to accept other naval sacrifices to get an international 'package deal' agreed or, on the other, to put British submarine capabilities very high on any Admiralty list of priorities.

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11. Board Minute No. 2391, 3 Nov. 1927, ADM 167/75.

12. Churchill to Bridgeman, 16 Jan. 1928, ADM 1/8765.

13. See Appendix: C.

14. Plans Division, 10 Nov. 1927, ADM 116/3371, 'Submarines and Disarmament.'

Anglo-French Naval Conversations - 1928: Disarmament Conference - Preparatory Commission

The major obstacle to any agreement on submarine limitation continued to be France, to whom the submarine remained an attractive method of levelling out naval strengths against both Britain and Italy. The policy of the French Government since Washington had suggested no willingness to reduce their total submarine tonnage requirements. Therefore, they were thought unlikely to prove amenable to any proposals for a reduction in quantitative or qualitative tonnage. However, if the French could be persuaded to an agreement then the concurrence of the United States and Japan was considered likely. During March 1928, a Preparatory Commission had been established at Geneva to prepare the ground for a future naval disarmament conference. The Commission's early proceedings brought to light the major stumbling block to any Anglo-French agreement. This concerned the British draft proposals on naval limitation, which centred on close classification and limitation of numbers within each category. French proposals were for limitation only on the basis of total tonnage. The United States and Japan tended to favour the British proposals with the former holding that, 'total tonnage contained the germs of eventual competition and would not lessen international suspicion, uneasiness and mistrust.'[15] The Italians sided with the French since the total tonnage proposals allowed them to maintain a low overall tonnage but still construct sufficient warships in the categories they preferred. Negotiations resulted in the British agreeing to tonnage limitation within categories while the French agreed to divide total tonnage into four groups, including submarines over 600 tons, as the basis for discussion.

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15. Mr. Gibson (U.S. Ambassador to Belgium), Mar. 1928, ADM 116/3321, '10th Meeting of the 3rd Session of the Preparatory Commission.'

The next stage of British policy was to press for a specific agreement on cruisers and submarines. In considering new proposals, the possibility of a future naval disarmament conference had always to be kept in mind. The expectation on both categories was that,

> 'the final disarmament conference will fix a maximum tonnage applicable to all Powers which no Power will be allowed to exceed during the period covered by the Convention. Within this maximum limit each Power will indicate at the final conference for each of these categories the tonnage they propose to reach and which they undertake not to exceed during the period covered by the Convention.'[16]

This made it important for Britain to obtain prior agreement with France on quantitative submarine tonnage in order to prevent a repetition of the failures at Washington and Geneva. A full naval disarmament conference was accepted as still being far in the future but specific timing depended on an agreement, 'on the system of classification and the elimination of a class of cruisers carrying 6 inch guns and below.'[17] Ratios were not considered necessary for submarines since: 'Submarines are not set off against submarines.'[18] Therefore, the suggestion was for British submarine proposals to be concentrated on a maximum tonnage approximating to the known claims of the other Powers. Although France and Italy were to be left to propose a total, the British target was a limit of 75,000 tons approximating, 'to the status-quo of the United States, Japan and France and the figure on which agreement seemed possible at the Coolidge Geneva conference.'[19] The estimation was that in addition to covering 'all

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16. Franco-British Disarmament Proposals, Mar. 1928, ADM 116/3371.

17. Ibid.

18. ADM 116/3371, 'Franco-British Disarmament Proposals.' (See Note 16.)

19. ADM 116/3371, 'Franco-British Disarmament Proposals.' (See Note 16.)

'reasonable requirements' the figure of 75,000 tons was only likely to be exceeded, within the next five years, by the claims of France and Japan.

British submarine requirements, based on this time scale and proposed tonnage had been the subject of extensive studies early in 1928. The overall requirements proposed by the Admiralty included operations, 'in the Baltic and Black Sea in the event of a war with Russia, and in the Far East in the event of a war with Japan.'[20] Modifications were made to the proposed system of Far East patrols, principally in their duration. This reflected the increased endurance hoped for from the post-war designs. The opportunity was also taken to assess future design requirements for patrol submarines. The recommendation in the case of Baltic operations was that the boats used, 'should be of the small type owing to the restricted and comparatively shallow waters in which they will have to operate.'[21] Far East operational requirements provided a far more complex problem. The need was for increased endurance and habitability and the resultant decision produced two different designs. The smaller design, required for operations in the shallow restricted waters of Northern Europe and the Mediterranean, had already been agreed to in the form of the 'S' class. However, development of the larger submarine ('T' class), for general patrol duties and specific replacement of the 'O', 'P', and 'R' classes in the 1930's, was to prove a much longer and more complex process, interrupted by the 1930 London Naval Conference.

During the summer and autumn of 1928 the issue of arms limitation remained in the forefront of British naval thinking, as the Anglo-French negotiations appeared to be approaching agreement. However, two problems

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20. D. of P., 30 May 1928, ADM 116/2606.

21. Ibid.

prevented these discussions from being considered as a purely naval or European issue as had been intended. Not only did any Anglo-French agreement involve limitation of land armaments but also both parties had to be careful not to appear to be excluding any of the other 'disarmament' Powers from consultation on any arms limitation proposal. The United States, while publicly supporting British attempts to achieve abolition of the submarine, had never adopted the belief that the submarine constituted a mortal threat to any nation's survival. Therefore, the Americans had been content to accept equivalent tonnage figures to Britain, although inferior to those claimed by France and Japan.[22] Nevertheless, any agreement between Britain and France on the submarine category made it necessary to demonstrate that none of these measures presented a threat to the overall naval position of the United States. Failure to do so carried the possibility of arousing an attitude in American political and naval circles which might lead to difficulties over other categories, such as cruisers, at a future naval disarmament conference.

On submarine abolition the British now admitted that: 'The trend of naval discussions at Washington in 1922 and subsequently has ... indicated that neither on total abolition nor on total tonnage limitation is agreement likely to be reached.'[23] Therefore, policy was to be directed towards a compromise with, in this instance, limitation being confined only to the larger submarines. However, freedom from tonnage restrictions was to exist only below 600 tons, which hopefully would prove an insufficient displacement for sustained operations outside coastal waters. This proposal had to be qualified by acceptance that: 'Against Great Britain however all submarines large or small built by European powers can

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22. See Appendix: G(8).

23. Admiralty, 1928, ADM 116/3371, 'The Anglo-French Naval Limitation Proposals.'

'be used offensively.'[24] Nevertheless, this attitude was included primarily for the United States's benefit since, despite French agreement to the proposal to limit all submarines over 600 tons, the United States Government had expressed a view that it saw no difference in offensive power between the two classes of submarine. Any appearance of concession was destroyed by the British reply that, 'the number of torpedoes carried in the smaller submarine is less, whilst the radius of operation is considerably curtailed. Their attacking power is limited and not to be compared with that of the larger submarine.'[25] Efforts to achieve a radical reduction in overall submarine tonnage were increased by the Admiralty during August in the hope that reduction in total British requirements would result in the French following suit.

> 'As regards the total maximum tonnage for large submarines, it is to our advantage to keep the submarine tonnage as low as possible. At Geneva we put forward 90,000 tons as a maximum for submarine tonnage of all descriptions with a proviso that not more than two-thirds of this total should be in large submarines. This would have allowed of 60,000 tons of large submarines, and I would propose that Admiral Kelly,' (senior British naval representative at Geneva), 'should have this figure in mind.'[26]

Hopes of success on this question were destroyed, as in 1927, by differences of opinion with the United States. In this instance, due to premature disclosure of impending Anglo-French agreement on several disarmament proposals, the Americans protested that the British were endeavouring to manoeuvre them into a position of inferiority or isolation. The result was a termination of negotiations and a strong denial by the British Government

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24. Madden to Bridgeman, 17 Aug. 1928, ADM 116/3371.

25. Admiralty, 1928, ADM 116/3371, 'Anglo-French Discussions - Final British Proposals on Submarine Limitation.'

26. ADM 116/3371, Madden to Bridgeman. (See Note 24.)

of any secret clauses or political understandings.

Meanwhile, although the Admiralty had extended contingency construction and war plans up to 1935, pressure was applied by the Treasury for a reassessment of the Navy's needs on ammunition, stores, and fuel oil up to 1938. The implication was that immediate economies should be possible in the Navy Estimates, especially on the specified items.[27] A further blow which struck directly at submarine construction had been occasioned by the advent of the Labour Government in June 1929, which led to a review of the 1928 programme. This resulted in the cancellation of two submarines and one submarine depot ship, reducing the submarine programme to four boats. These reductions elicited a strong protest from the Sea Lords, allied to a request for the restoration of the original submarine quota.

> 'Our submarine requirements have been formulated at 72, viz. six submarines a year, with an age limit of twelve years. Of these, 60 were to have been of the "O" type and twelve of the fast fleet type of submarine. Since these proposals were considered a demand has arisen for a faster type than the "O" type between it and the fast fleet type, and for a smaller submarine - to be known as the "S" type - which could be built in place of a number of the "O" type.'[28]

The view was that the proposed reductions had been sanctioned by the Government, 'in order to effect a measure of immediate economy and to assist the conversations with the U.S.A., particularly in regard to the cruiser question.'[29] In both assumptions the Admiralty was correct but having made the analysis the Sea Lords did nothing about it; their response was inactivity rather than the spirited resistance of previous years.

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27. Churchill to Bridgeman, 31 July 1928, ADM 116/3388.

28. Madden to D.C.N.S., Vice-Admiral Sir William W. Fisher, 2 Oct. 1929, ADM 116/2606, P.D. 03391/39, 'Naval Construction Programme.'

29. D. of P. to Fighting Services Committee, 10 Oct. 1929, ADM 116/2606, 'Memo on Proposed 1929 Construction Programme.'

Confirmation of the suspicions over cruisers was not long in being supplied. During October, Ramsay MacDonald and President Hoover came to a tentative agreement whereby a basis of 50 cruisers of 330,000 tons was established.[30] Invitations were then extended to Japan, France, and Italy to attend a naval disarmament conference in London during January 1930.[31] Meanwhile, the 1929 programme had been suspended in October pending investigations by the Fighting Services Committee and the Admiralty had to place before the Committee, 'the naval construction requirements for the 1929 programme, taking into consideration the measure of agreement which has been reached with the U.S.A., and the possible effects, if general agreement is reached at the five power conference in January next.'[32]

Abolition v Limitation of the Submarine - Policy for the London Naval Conference

One of the 'possible effects' was the question of either submarine limitation or abolition. In evidence to the Fighting Services Committee the Admiralty reaffirmed support for reduction of submarine construction only, 'to the minimum rendered possible by agreement with other powers.'[33] Although no mention was made of abolition it had been stated officially that: 'The British Empire and the U.S.A. agree in their desire to abolish the submarine as an instrument of war.'[34] In practice this was largely a diplomatic gesture as the United States did not consider the submarine to

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30. General Dawes(United States Presidential Representative) to Ramsay MacDonald, 29 Aug. 1929, Documents on British Foreign Policy, (London, 1946), 2 ser., I, 57-58.

31. Arthur Henderson (Foreign Secretary) to Ambassadors of France, Italy, and Japan, 7 Oct. 1929, D.B.F.P., 2 ser., I, 103-105, 'Invitations to the London Naval Conference.'

32. ADM 116/2606, '1929 Construction Programme.' (See Note 29.)

33. ADM 116/2606, '1929 Construction Programme.' (See Note 29.)

34. ADM 116/3388, Churchill to Bridgeman. (See Note 27.)

be the naval threat that the British held it to be. Moreover, support for British abolition proposals was contingent on agreement by other nations. Under these circumstances it was a useful negotiating weapon for the United States with the British over cruiser numbers. Although the main emphasis of British policy on submarines was now directed towards agreement on quantitative tonnage limitation, proposals for abolition were retained; but in place of a reaffirmation of the supposed inhumanity of the submarine, the intention was to emphasise that this weapon was irrelevant and obsolete as a result of advances in A/S devices and techniques. Thus,

> 'when public reference is made to the question,' of abolition, 'it is desirable to lay emphasis, not on the threat of the submarine, but rather on the advance in anti-submarine methods since the war, showing how in the late war the submarine was only a serious menace during the time that our methods of anti-submarine attack were still not fully developed.'[35]

Asdic and Convoy

During the period since Washington, British naval thinking on the submarine threat had undergone several alterations and the submarine limitation proposals reflected some of these. Disagreement on the effectiveness of convoy extended to the highest levels of the Admiralty. Events of 1917-18 had proved that the U-boat posed a major threat to Britain's wartime survival. Yet, the A/S lessons were soon forgotten, as was the effectiveness of the convoy system if properly prepared and implemented. Quite why this should be is uncertain; perhaps it had something to do with the slow production of the Official Histories of the period, or perhaps with a recollection of the political pressure to which the Admiralty had been exposed over the decision to introduce convoys. Certainly no major staff

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35. D. of P. to Madden and Fisher, 12 July 1929, ADM 116/2686, P.D. 03394/29.

study of the U-boat campaigns had been done. In 1928, the A.C.N.S. (Admiral Dudley Pound) and the D.C.N.S. (Admiral W.W. Fisher) were both opposed to convoy as a defensive technique.[36]

Advances had been made in Asdic and other A/S equipment since 1918 but whether that progress had been sufficient to guarantee a successful defence against the submarine was still far from certain. Nevertheless, many officers asserted their confidence in the ability of Asdic to defeat any future U-boat threat, and therefore remove the need for convoy. However, the First Sea Lord, Admiral Madden, continued to support the decision to implement convoy against submarine as well as surface attack.[37] Despite this the bulk of naval opinion preserved an anti-convoy viewpoint. An additional persistent problem was the shortfall between the number of A/S escorts needed to allow efficient use of the Asdic device and the limited resources the Government was prepared to make available for new construction.

In many instances, Asdic-equipped vessels could only 'sweep' efficiently at a maximum speed of ten knots and only under the best weather conditions. This was clearly inadequate since submarines could use their higher surface speed to alter their position in relation to the convoy escorts before submerging to attack. Exercises against fast troop convoys, rather than the slow merchant convoys which would predominate in war, produced disappointing results for the A/S forces.

> 'The operations of the A/S vessels from an asdic point of view do not appear to be entirely satisfactory in that on the two occasions when contact was gained with the submarine as a result of a search scheme, both A/S vessels, shortly after the commencement of the "hunt", lost contact which was never regained. All ships report that asdic

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36. Board Minutes of 14 & 21 Apr. 1928, ADM 1/8765/313.

37. Board Minute of 8 May 1928, ADM 1/8765/313.

> 'operating efficiency was considerably impaired due to the weather conditions.'[38]

Nevertheless, the Admiralty remained reasonably satisfied with the ability of the escorts to keep the submarine underwater during daylight hours, which could cause it to fall behind the vessels it was shadowing due to its poor underwater speed. Little or no consideration was given however to the use of radio to enable groups of submarines to remain in contact and facilitate concentration for attack on the convoy, overwhelming the escort forces by weight of numbers. This omission is understandable, however, given the Admiralty's preoccupation with the warship as the main target for British submarines and with the essentially defensive mode of thinking that was inherent in the dependence upon anti-submarine policy. Similarly the only attention given to the use of British submarines in a surface role was in the shadowing or reconnaissance of enemy warships and fast troop transports, where the low underwater speed of the submarine required it to operate on the surface. Exercises raised doubts about the use of submarines for surface shadowing.

This form of reconnaissance had been one of the most firmly advocated duties during the 1920's for British submarine forces. Support was given not only by successive Rear-Admiral (S)'s but by many other senior naval officers and possibly reflected a preoccupation with attempts to use the submarine as a substitute surface warship. Evidence by operational commanders tended to differ.

> 'The poor qualities of the submarine as a surface reconnaissance craft was clearly shown ... by the number of times destroyers sighted submarines on the surface. It is not perhaps generally realised to what extent

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38. Tactical Division, Dec. 1929, ADM 186/145, 1, C.B. 1769/29(1), 'Exercises and Operations 1929: Exercise O.C. - 1/2 May 1929; Remarks of Captain (D), 2nd Destroyer Flotilla.'

> 'submarines are handicapped by their low height of eye, by the vibration inseparable from the Diesel engine, and by the difficulty in keeping an adequate lookout over the whole horizon with the restricted space and personnel available on the bridge.'[39]

The practical value of even troop-convoy exercises was diluted by the fact that: 'The convoy enjoyed a measure of protection which would not usually be available except for expeditionary forces, and it was possible to provide for most requirements, particularly as no provision had to be made vis-a-vis surface forces.'[40] Further, the practice of crediting participating warships with artificial speeds was capable of producing erroneous conclusions, particularly in respect of operational and projected submarines. Complaints that submarine were being excessively hampered in these exercises by safety restrictions resulted in only small concessions; surface warships were allowed to zig-zag but they were still forbidden to alter course to evade attack or avoid torpedoes and A/S vessels were still not permitted to carry out 'hunts' for submarines. Despite this the purpose of these exercises was stated to be, 'to exercise all forces in their functions of war.'[41]

British Proposals on Submarine Tonnage Limitation at 1930 London Naval Conference

An agreement for a quantitative limit on submarines of 90,000 tons had seemed possible to the Admiralty at the 1927 Geneva Conference and this total was favoured as an initial proposal for the London Naval Conference. However, the ultimate aim remained a much lower figure. The greater the

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39. Ibid, Remarks of Captain (S), 1st Submarine Flotilla.

40. Tactical Division, Nov. 1930, ADM 186/147, C.B. 1769/30(1), 81, 'Exercises and Operations 1930: Exercise A.U. No. 6 - 28/30 Mar. 1930, Atlantic Fleet.'

41. Tactical Division, June 1931, ADM 186/147, C.B. 1769/30(2), 86, 'Exercises and Operations 1930: Submarine Exercise No. 10, Exercise A.U., 27-29 Oct. 1930.'

reduction in foreign submarine tonnage the less would be the need, under the Admiralty's calculations, for large and expensive A/S forces.[42] An additional proposal favoured the application of the Washington ratios to the submarine category. However, modification of the ratios to suit Japan, France and Italy would be accepted if necessary so as to obtain agreement. France and Japan were expected to claim totals of 80,000 and 90,000 tons respectively, while Italy although seeking parity with France[43] would agree to abolition in the unlikely event that the other Powers also agreed.[44] Even if abolition was accepted, the Japanese were expected to be, 'more insistent ... than ever for a full 70% of 8-inch cruiser tonnage of the strongest Power, thus rendering yet more difficult the settlement of our cruiser difficulty with the United States and Japan.'[45] Certainly, the importance of the cruiser category to the success of the Conference had been evident in the strength of the differences between Britain and the United States and was shown by the need for a tentative agreement before proceeding to the full Conference. The necessity of reaching similar agreements with the other major Powers led to the acceptance, 'that it will eventually be necessary for His Majesty's Government in the United Kingdom ... to agree to the retention of the submarine.'[46] However, in the best tradition of diplomatic negotiations, this decision was not to be made known until France and Japan agreed, 'to adopt a reasonable attitude in regard to some

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42. Henderson to R.H. Campbell (Paris), 26 Nov. 1929, D.B.F.P., 2 ser., I, 150.

43. Sir R. Graham (Rome) to Henderson, 11 Nov. 1929, D.B.F.P., 2 ser., I, 134.

44. Graham to Henderson, 11 Dec. 1929, D.B.F.P., 2 ser., I, 163.

45. Cabinet to Admiralty, Dec. 1929, ADM 116/3372, 'London Naval Conference 1930 - Proposals to be Submitted by H.M. Government,' 13 and 30.

46. Ibid.

'of the other difficulties which will confront the Conference,'[47] principally over new cruisers and capital ship replacement.[48]

Domestic and Political Effects on Preparations for the London Naval Conference

Clearly the decisions at the London Naval Conference would be determined by more overly political considerations than at Geneva in 1927 or Washington in 1922. The Government were seemingly determined to ignore the recommendations of their naval advisers in the preliminary negotiations with the invited Powers. Ramsay MacDonald in conversation with the French Ambassador during November 1929 had said, on submarine abolition, that: 'Unless an international agreement on the subject could be concluded ... it would be useless to pursue the point.'[49] This was contrary to Admiralty advice not to disclose the demise of the abolition policy as long as it remained a useful negotiating measure, especially with the French and Japanese. Further, on 9 December, MacDonald informed the Japanese Ambassador that, 'whilst His Majesty's Government felt that it would be advisable to stop the use of this arm,' (submarines) 'at the same time they knew that certain other Powers could not agree with them.'[50] In essence, the Government were admitting defeat on the question of submarine abolition before the start of the Conference. Moreover, they were envisaging a hard struggle to achieve what they considered a satisfactory limitation of submarine tonnage. Certainly, in the Admiralty's opinion, another negotiating advantage was being conceded since the Government could no longer

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47. ADM 116/3372, 1930 London Naval Conference. (See Note 45.)

48. Foreign Office, Sept. 1929, D.B.F.P., 2 ser., I, 85, 'Draft Note of Invitation to the Naval Conference.'

49. Henderson to Campbell, 26 Nov. 1929, D.B.F.P., 2 ser., I, 150.

50. Henderson to Sir J. Tilley (Tokyo), 11 Dec. 1929, D.B.F.P., 2 ser., I, 162.

appear to be relinquishing a position in order to achieve better terms on other categories such as cruisers.

The Government continued to be motivitated by a need for economy, especially in defence spending, as was evident in the attitude towards the Navy Estimates under review by the Fighting Services Committee. The 1929 as well as the 1930 programmes were examined,

> 'with a view to seeing whether the desire of the Chancellor of the Exchequer for a reduction of £5,000,000 on the 1929 Navy Estimates could be fulfilled, and if so how.' Submarines were considered, 'capable of being affected by any decisions of the Conference,' and therefore: 'The Treasury,' were, 'not without hope that the Conference may pave the way for an all-round reduction of armaments on a greater scale than the Admiralty anticipate and they consider that it would be wrong to authorise any further building until the results of the Conference are known. In particular, any decision taken now in regard to Submarines appear to the Treasury to be inconsistent with the policy of abolition of that class which, it is understood, H.M. Government intend to put forward at the Conference.'[51]

Clearly no one had informed the Treasury that the Prime Minister no longer considered submarine abolition to be a feasible policy. Reluctantly, the Admiralty agreed, 'on grounds of policy,' to the Committee's proposal to suspend submarine construction until the results of the London Naval Conference were known,[52] even though the existing force numbered only 53 with ten more boats building.[53] In addition, the submarine category was placed last on the building order of priority. The 1929 submarine programme was reduced to three boats which were then suspended until the Conference concluded. Only if the submarine was retained would a

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51. Admiralty and Treasury to Fighting Services Committee, 13 Dec. 1929, ADM 1/8739/40, 'Report on the 1930 Naval Estimates.'

52. See Appendix: G(9).

53. Murray to Board, 7 Jan. 1930, ADM 1/8739/40.

Supplementary Vote then be passed to restore the orders for the suspended boats. Finally, to complete a black picture for the Admiralty, the Committee recommended that two submarines of the 1928 programme should be cancelled.

Submarine Proposals at the London Naval Conference

Contradictions on British submarine proposals continued to exist up to the opening of the London Naval Conference on 17 January 1930. On 9 January the Cabinet Committee on the London Naval Conference reported that despite the fact that the United States and Italy might agree to submarine abolition, clearly in view of the known opposition of France and Japan, 'an agreement to abolish submarines was improbable.'[54] However, on 14 January the Cabinet announced that: 'The Government has declared its intention to move for the total abolition of the Submarine,' while confirming the 9 January decision that:

> 'In view of the opposition of France and Japan, there is little chance of our success in this, however. We shall, therefore, have to fall back upon reductions and shall have to use all the pressure we can to bring Submarine strengths down,... We should propose a maximum tonnage for Submarines, not to exceed 1,500 tons, and also a maximum gross tonnage which must include both the largest and the smallest Submarines built. There must be no unregulated Submarines as was proposed in the Anglo-French Agreement.'[55]

The result was that not until the 16 January was the Admiralty able to set out the final proposals for the Conference.[56]

The failure to achieve agreement on quantitative submarine tonnage limitation at the 1927 Geneva Conference had been blamed on the refusal

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54. Cabinet Committee, 9 Jan. 1930, ADM 116/2747, '5th Meeting.'

55. Cabinet, 14 Jan. 1930, ADM 116/2747, 1 (30).

56. Madden, 17 Jan. 1930, ADM 116/2746, 'Basis of British Naval Strategy.'

of the United States and Japan to accept sub-division of their tonnage quotas into large and small submarines.[57] The Admiralty deemed this division necessary since, 'the Submarine possesses most powerful offensive attributes,' and: 'In these circumstances, it is held that our submarine strength depends upon the relative strength of other Powers.'[58] However, if the naval strength of the Conference Powers were to be based on the Washington ratios then the Naval Staff recommended that any figure of submarine tonnage which was practical should be agreed to. Needless to say, a 'practical' limit would be expected to approximate to the total proposed by Britain. As a further incentive the proposals were to include the offer of variations in the Washington ratios in the interests of reaching an agreement. However, the basic question remaining unanswered was whether there was a difference between the politicians and their naval advisers as to what total constituted a 'practical' tonnage. Only the proceedings of the Conference could provide a definite answer.

1930 London Naval Conference: 17 January - 22 April 1930

During the initial stages of the Conference the British made clear their intention, failing abolition, to attempt to divide the submarine question into two sections.

> 'If an agreement upon this,' (abolition), 'is impossible the Government will put forward proposals limiting submarines rigidly to defence requirements in number and size. Its position during the negotiations on this arm will be to obtain the lowest possible limits. It will also propose to revive the agreement signed at Washington on the 6th February 1922, but not fully ratified by the signatory Powers, to

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57. See Appendix: H(3).

58. ADM 116/2746, 'Basis of British Naval Strategy.' (See Note 56.)

> 'regulate the attack of merchant ships by submarines in accordance with the rules and practice set forth in the treaty.'[59]

Not unexpectedly it rapidly transpired that abolition had no chance of success. Once again a major part of the British case had been that the submarine was not a coast-defence weapon and could only be used for offensive purposes. Little credence was placed on British claims that they were not seeking abolition because of the nation's dependence on merchant shipping in wartime. The Delegations also remained unmoved by statements pointing out that the other Allied Powers had lost over 2,000,000 tons of merchant shipping and that Britain was only attempting to save the other Powers unnecessary expenditure since submarines,

> 'are expensive in maintenance; they have the most complicated machinery and a very high proportion of skilled personnel is required to man them. They are very expensive to build. They require extensive provision in the way of shore establishments and depot ships to maintain them.'[60]

The financial argument proved weak because it could, with only minor alterations, be applied to any category of warship. A much more convincing argument was to be found in the claims of, 'large savings in the provisions of destroyers and anti-submarine units,'[61] stemming from a successful abolition agreement. Although the United States officially supported the British, American interest lay more with achieving agreement on restricting submarine operations against merchant shipping.

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59. Cabinet, 7 Feb. 1930, ADM 116/2748, 'Documents on the L.N.C. - Position at the London Naval Conference, 1930, of His Majesty's Government in the United Kingdom.'

60. First Lord A. U. Alexander, 11 Feb. 1930, ADM 116/2748, '4th Plenary Session,' 187-91.

61. Ibid.

However, the French remained firmly opposed to abolition and made it clear that support for an agreement on legal restrictions would only be given if the submarine, 'as far as both rights and duties are concerned,'[62] was treated in a similar manner to the surface warship. The French then proposed that: 'A committee should be appointed to prepare an agreement open for signature to all naval powers, forbidding submarines to act towards merchant ships otherwise than in strict conformity with the rules, either present or future, to be observed by surface warships.'[63] The Italians vacillated and declared themselves in favour of both abolition of the submarine and legal restrictions upon submarine operations, with the final choice depending upon the decision of the other Powers. As had been expected, the Japanese supported the French proposal, maintaining that: 'The submarine has its proper legitimate uses,' while agreeing to the need for a 'formula to terminate the abuse of submarines.'[64] The United States responded with the proposal:

> 'that a committee should be appointed to study and report to the Conference as to the possibility of agreement on the following questions:- I. The abolition of the submarine; II. Regulation of the use of the submarine - through subjecting it to the rules of war governing the use of surface craft; III. Regulation of the unit size of submarines.'[65]

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62. M. Leygues (French Delegation), 11 Feb. 1930, ADM 116/2748, '4th Plenary Session,' 193-98.

63. Ibid.

64. Admiral Takarabe (Japanese Delegation), 11 Feb. 1930, ADM 116/2748, '4th Plenary Session,' 200-2.

65. United States Delegation, 11 Feb. 1930, ADM 116/2748, '4th Plenary Session.'

On the 12 February all these resolutions were referred by the First Committee[66] to the Committee of Experts.[67]

Legal Restrictions on the Use of Submarines

Initial discussions moved slowly and on 3 March the British presented their proposals on legal restrictions, attempting to present themselves as an honest broker between the French and the Americans, despite their position being closer to that of the latter. Following the Washington Conference a series of articles on legal restrictions known as the Root Resolutions had been presented to the Conference Powers as a treaty for ratification.[68] However, the French had consistently refused to ratify and were expected to hold to this policy. There was a slim possibility that if only Articles I and II of the Root Treaty were retained and Articles III and IV omitted the French might agree to ratify. However, it was equally clear that if these Articles were abandoned then the United States Senate would not ratify the revised Treaty. Any uncertainty which may have existed over this point was dispelled by the United States insistence on Articles I - IV being retained intact. The British supported this, especially Article IV, concluding that if this clause was adhered to,

> 'it practically ruled out the use of submarines. It was certain that a submarine could not be operated against merchant craft in the same way as surface vessels and should a Nation possessing large numbers of submarines operate them against

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66. British delegates on the First Committee were Mr. R.L. Craigie (Chairman), A.M. Cadogan, Captain R.M. Bellairs, Captain E.L.S. King, Lieut.-Colonel A.G.B. Browne, Mr. Alex Flint.

67. The Committee of Naval Experts was made up of naval representatives from each of the Delegations. See ADM 116/2748, 'Documents on the L.N.C.,' 426, for a complete list of these representatives.

68. See Appendix: H(1).

> 'Great Britain ... it would be impossible for her to abide by the rules laid down for surface craft.'[69]

There was no doubt, however, that there would not even be a 'paper' treaty unless all five Powers ratified any agreement no matter how many non-Conference nations accepted it. Therefore, the British decided,

> 'to adopt a preliminary attitude in deciding in favour of upholding ... ratification of the Root Treaty, but on ... finding that acceptance of such a proposal was impossible, to make an attempt to secure agreement on a new draft Treaty which would go as far as it was possible to meet the wishes of both the U.S.A. and France.'[70]

In turn, the Committee of Experts recommended the return of the legal restriction question to the First Committee, if the attempts to reach agreement on submarine abolition failed.

Submarine Abolition

Meanwhile, the thorny problem of abolition had also been handed to the First Committee, where progress was immediately blocked by the French. In an attempt to solve this situation the problem was passed on the 12 February to the Committee of Experts who, 'unanimously agreed that this was a question with which they were unable to deal with owing to its essentially political character.'[71] In addition,

> 'the view was expressed, by more than one delegation, that the discussions which had taken place at the Fourth Plenary Session, also at the Fourth Meeting of the First Committee, clearly indicated that it was not desired that the Committee of Experts should attempt to examine this resolution in any way.'[72]

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69. Alexander, 3 Mar. 1930, ADM 116/2747, '8th Meeting of British Commonwealth Delegation.'

70. Committee of Experts, 4 Mar. 1930, ADM 116/2246, L.N.C.(E) 15, 'Legal Aspects of Submarines.'

71. Ibid.

72. Committee of Experts, 11 Mar. 1930, ADM 116/2748, '3rd Report,' 418.

This resulted in the abolition question being referred back to the First Committee for further discussion. However, when the matter was raised at the Seventh Meeting the national Delegations refused to alter their positions and it proved impossible to reach any agreement. The final pronouncement was that, 'no agreement has been reached which would render possible the abolition of the submarine.'[73]

Legal Restrictions on Submarines - Stage II

In an attempt to clear the impasse created by French and American disagreement over the Root Treaty, the British suggested that a possible compromise would be to agree on a Declaration rather than a Treaty. The former would be restricted to a statement of what was recognised as international law. Although the Americans were prepared to respond by adopting a more flexible attitude on retention of all four Articles of the Root Treaty, there was disagreement among the British Delegation on this point. The First Lord's view was that, 'Article IV was an important one as it, in fact, made it impossible for submarines to operate against merchant ships altogether,' but Admiral Madden emphasised that: 'The Admiralty, however, desired that the submarine should be capable of exercising its right to inspect merchant vessels for information.'[74] Moreover, a contradiction existed between Articles II and IV since,

> 'Article II implied that the submarine had the right to deal with merchant vessels providing the rules governing surface craft were observed and then Article IV summarily denied this right by saying that the submarine could not operate against merchant ships because it could not comply with the rules applicable to surface warships.'[75]

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73. First Committee, 12 Apr. 1930, ADM 116/2748, '3rd Report,' 413.

74. British Commonwealth Delegation, 13 Mar. 1930, ADM 116/2747, L.N.C.(E) 16, '9th Meeting.'

75. Ibid.

Finally, the British decided to accept omission of Articles III and IV and confirmation of the suggested Declaration was put forward on the 4th March. The latter was largely a concession to the French since submarines were no longer prohibited from attacking merchant vessels as in Article III of the Root Treaty. However, in practical terms the Declaration was so worded as to make such an attack impossible if the rules were obeyed. The removal of Article IV was not regretted by the British since the Admiralty had never been happy with the piracy reference and its consequences. The First Committee supported the recommendation that a Declaration on the legal aspects of submarine warfare should be accepted as established rules of international law and subsequently the Declaration was entered in the London Naval Treaty.[76]

Qualitative Submarine Tonnage Limitation

British policy for agreement on qualitative limitation appeared more likely of fulfilment than abolition, although it was accepted that any agreement would only affect future construction. The United States proposed 1,800 tons as a maximum limit and the figure was accepted by Britain but rejected by France and Japan. The latter suggested a 2,000 tons limit which the French supported provided they were allowed to possess a limited number of submarines displacing up to 3,000 tons each. The French claim therefore raised again the concept of two classes of submarines. Although the British had proposed two classes at the 1927 Geneva Conference the figures then had been much lower. The negative reaction of both Britain and the United States prevented any further progress on the French proposal and all the Conference Powers, with the exception of France, agreed to accept 2,000 tons as the upper qualitative limit. Despite this, the French continued to seek a guarantee allowing a small number of submarines over

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76. See Appendix: H(4). (Part IV, Article 22.)

2,000 tons before also adhering to the agreement.[77] Finally, a compromise was agreed on the basis that, 'the maximum unit displacement of submarines be fixed at a figure of 2,000 tons,' but, 'each of the Powers represented at the present Conference may be permitted to maintain not more than three submarines of a maximum unit displacement of 2,800 tons.'[78] However, the boats allowed in the larger category were to be included in each Power's overall submarine tonnage quota. Agreement was also reach on a maximum gun calibre of 5.1 inches (130 mm.), except in the case of the larger submarines which could carry a 6.1 inches (155 mm.) gun. To secure French acceptance, an exception was made to allow the retention of an 8 inch gun already fitted on one of their submarines. Overall, these agreements had to be considered a partial victory for the British in so far as they amounted to a restriction of the other Powers' submarine forces.

Quantitative Submarine Tonnage Limitation

The British were less successful on quantitative limitation. Initial proposals had been based on a total of 78,000 tons but the French had merely rejected this figure and countered with a claim for 100,000 tons. The British reply can hardly have been intended to be acceptable, being fixed at the low level of 40,000 tons.[79] Italian claims were also viewed with disapproval since they were considered to threaten British attempts to restrict future submarine construction. Finally, the Japanese added to the difficulties by regarding the submarine category as a useful negotiating weapon for hopefully extracting concessions on cruisers and other items from the British and Americans. This particular situation was galling for

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77. Committee of Experts, 11 Mar. 1930, ADM 116/2748, '3rd Report,' 419-25.

78. First Committee, 12 Apr. 1930, ADM 116/2748, '3rd Report - Part III,' 414-16.

79. British Delegation, 12 Mar. 1930, D.B.F.P., 2 ser., I, 242-48, 'Meeting of the Representatives of the U.K., U.S., and French Delegations.'

the British: they had intended to adopt an identical attitude to the Japanese to ensure agreement on reductions in the submarine category, but not at the expense of increases in the tonnage of other categories. Not unnaturally, they rejected the Japanese claims as too high[80] and on cruisers refused to alter their position that Japan should be allowed only twelve of the 8 inch gun cruisers to Britain's fifteen. Initiatives by Britain and the United States finally resulted in the Japanese agreeing not to exceed 52,729 tons in the submarine category by 31 December 1936.[81] The British considered an agreement with Japan necessary so as to forestall French moves, 'to enlist the Japanese Government as an ally against the United States and Great Britain, particularly on the question of submarines.'[82] Thus, they were quietly satisfied because: 'We have succeeded in getting Japan down in Submarine tonnage from 78,000 to 53,000 roughly ... whilst our present figure of Submarines built is 45,500 so that the general arrangement is advantageous to us.'[83] However, France and Italy refused to sign the agreement and negotiations continued between them on the question of parity.

Finally, the Treaty, signed on 22 April 1930, tidied up the question of the definition of a standard displacement for submarines left over from the 1927 Geneva Conference.

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80. Henderson to Tilley, 15 Mar. 1930, D.B.F.P., 2 ser., I, 249-51.

81. See Appendix: H(4). (Part II, Article 6.)

82. D.B.F.P., 2 ser., I, 249-51. (See Note 80.)

83. D.C.N.S., Vice-Admiral W.W. Fisher to Lord Jellicoe, 1930, Fisher MSS, F.H.R./11, F.H.R./MS67/010, National Maritime Museum (N.M.M.).

Franco-Italian Discussions 1930-31: Submarine Issues

Following the Conference the British Government were concerned to secure French and Italian acceptance of the Treaty. The British had indicated unofficially during the Conference that as a last resort they were prepared to agree to allow the French a 65,000 tons submarine force. However, this had been on condition that an assurance was given, 'that the French would not regard this as a final figure but as a stage towards an eventual parity figure of 52,700 tons.'[84] Excessive French demands were seen as providing an incentive to the other naval Powers to increase their submarine forces. Moreover, although the danger of war with France was viewed more as a contingency than a reality it had to be recognised that a majority of British trade routes converged within convenient operating distance for even the smallest of French submarines. In the case of the Japanese submarine force the threat was considered less critical because of the vast distances involved in the Far East.

Therefore, the British considered it extremely important to persuade the French and the Italians to accede to the London Treaty and this meant involvement in the naval discussions between the two nations, who had been persuaded to meet at Geneva in November 1930. The Italians quickly stated that they, 'could not accept a lower submarine tonnage than 52,700 tons.'[85] This proposal was not unexpected since allied to parity with the French this gave them an extra 8,000 tons. However, the British attitude was that:

> 'As regards submarines ... there seemed little hope of ... being able to reduce the French below 77,500 tons because their present figure for submarines built, building and authorised

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84. Henderson to Lord Tyrrell (Paris), 4 Nov. 1930, D.B.F.P., 2 ser., I, 422-24.

85. Mr. R.L. Craigie (Foreign Office), 1 Jan. 1931, D.B.F.P., 2 ser., I, 428-43.

'was nearly 98,000 tons; and the French could not by 1936 reach a figure lower than 77,500 without either scrapping under-age submarines or else abandoning the construction of submarines which had been authorised by Parliament and on which a large amount of work had already been done. On the other hand, the British Government were quite unable to accept such a high submarine figure for France with the British treaty figure standing at 150,000 tons for destroyers. This constituted one of the most serious Anglo-French difficulties.'[86]

The Japanese were also unhappy at the prospect of any post-Conference agreement giving the French a higher total than 52,700 tons since this would mean that France had achieved her object merely by holding out a little longer. Logically this could not be denied and therefore the British produced elaborate reasons for initially offering the French a higher tonnage, although they hoped to restrict the final figure to approximately the London Treaty quota.

Discussions in Paris failed to alter the French position and the final British proposals allowed them 77,548 tons and the Italians 52,700 tons. This proved insufficient for the French who now wanted a total of 83,137 tons. British reaction to this was to threaten an increase in destroyer tonnage under Article 21 of the London Naval Treaty,[87] while the French defended their tonnage claim as being due to the fact that,

'at the time the Treaty was signed, France already had an authorised programme which would have automatically brought her figure up to 78,500 tons of under-age submarines in 1936 and that she had in addition been given the right under Article 7 of the Treaty of London to construct two cruiser submarines with a total tonnage of 5,600, making 83,000 tons in all.'[88]

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86. Ibid.

87. LONDON NAVAL TREATY, 1930, (Part III, Article 21.)

88. Tyrrell to Henderson, 20 Feb. 1931, D.B.F.P., 2 ser., I, 453-55.

Thus, they considered there was no justification for Britain resorting to Article 21, to which the British countered that they have never agreed to 78,500 tons and even their offer of 65,000 tons had been unofficial. Moreover, the hope had been that France would agree to abandon the 11,000 tons scheduled under her 1930 programme as well as the two projected cruiser submarines. In the British view, failure to do this invalidated previous calculations on A/S forces and destroyer tonnage. Both sides remained unmoved by each others' arguments and in view of the reports from Paris, the Foreign Secretary Arthur Henderson and the First Lord A.V. Alexander decided to make a personal effort to break the deadlock. Following their arrival on 23 February they were engaged in twenty-four hours of intensive discussions resulting in a provisional agreement by the French to undertake no further submarine construction, 'other than for completion of the 1930 programme and for replacement of tonnage becoming over-age after December 31, 1931.'[89]

The French considered this agreement as a victory, in the sense that Britain had apparently approved the French claim for 81,989 tons in retum for the dubious benefit that France would raise no objection to quantitative tonnage being re-introduced at the proposed League of Nations Disarmament Conference, scheduled for 1932. Unofficially, the British still considered that French submarine tonnage was too high, especially in relation to British destroyer tonnage of 150,000 tons, and they were concerned about the effects of the agreement on the other Powers' submarine fleets. Therefore, in the event of failure to reach, 'a more satisfactory equilibrium between French submarine tonnage and British

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89. Tyrrell to Sir R. Vansittart, 24 Feb. 1931, D.B.F.P., 2 ser., I, 458-60.

'destroyer tonnage His Majesty's Government will retain their right to make such an increase as they judge necessary in British destroyers figure of 150,000 tons.'[90] The crucial question for the Admiralty was whether, in view of the Government's past record on disarmament, allied to continuing economic problems, such an increase would be of more than token size. The United States appeared dubious about the proposed French tonnage, especially in relation to ratification of the London Treaty by the Senate: expansion of destroyer forces under Article 21 was only permissible in reply to action by non-signatory Powers. Therefore, the United States preferred the Franco-Italian naval discussions to result in a separate agreement rather than in acceptance of the London Treaty.[91] The Japanese were more amenable but still dissatisfied.[92] Meanwhile, the Italians agreed to accept submarine parity with Britain, the United States and Japan and not to include any submarines in their 1931 programme, nor to lay down any new submarine tonnage until 1933. Although a 'Bases of Agreement'[93] was signed by France and Italy on 11 March 1931, French dissatisfaction resulted in the breakdown of the Agreement by September. This failure destroyed all current hopes of securing French and Italian adherence to the London Naval Treaty and although both were still bound by the provisions of the Washington Treaty, France remained unfettered by any agreement on the use of submarines either in the form of the Root Treaty or Part IV of the London Naval Treaty.

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90. Ibid.

91. Sir R. Lindsay (Washington) to Henderson, 26 Feb. 1931, D.B.F.P., 2 ser., I, 460 and 466-67.

92. Mr. Snow (Tokyo) to Henderson, 27 Feb. 1931, D.B.F.P., 2 ser., I, 461.

93. See Appendix: H(5).

Results of the London Naval Conference

The British had three major proposals on submarines prior to the Conference. Officially, abolition had been one of these policies but expecting failure, the main emphasis centred on attempts to achieve tonnage limitation agreements, supported by legal restrictions on the use of submarines in war. Failure to ensure French and Italian accession to the London Treaty meant that all three proposals had ended in partial or total failure. Abolition, as expected, had never appeared as a possible agreement, while only on qualitative limitation and legal restrictions had anything resembling success been achieved, through agreements with the United States and Japan. However, the proposals accepted on legal restrictions were considered by the Admiralty to be only a reaffirmation of the existing position.

> 'Root Treaty Articles I - IV never came into force since the French refused to ratify. Article XXII of the London Naval Treaty cannot be described as replacing or superceding the above mentioned articles of the Washington Treaty of February 6, 1922, since the latter never became effective. Its provisions are expressly described as representing established rules of international law.'[94]

Moreover, the failure to secure French acceptance of the Conference agreement on quantitative limitation opened up the possibility of an increase in foreign submarine fleets, as the other major Powers reacted to the undesirability of allowing themselves to be fettered by Treaty to a fixed tonnage while the French remained free to build at will. All in all, the Conference relieved the Admiralty of the dilemmas about how to shape British submarine policy that had existed before the Conference met.

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94. Admiralty, 20 May 1930, ADM 1/8741/88, 'Reply to House of Commons Question.'

Effect of the London Naval Conference on

British Submarine Construction

The Admiralty's initial concern was with the 1929 and 1930 submarine programmes which had been suspended pending the results of the Conference. The Cabinet had cancelled three of the six submarines of the 1929 programme on the recommendations of the Fighting Services Committee and a Supplementary Estimate was necessary to restore the remainder of the programme.[95] In addition, continuation of the existing scrapping schedules up to 31 December 1936 meant that there would be a net reduction in numbers of 23 submarines during the period. Even if the pre-Conference proposal for a force of only 40 boats was retained it required an annual rate of construction of just three submarines, although 3,700 tons per annum would be available under the Treaty.[96] Clearly the proposed annual programmes were inadequate, producing a shortfall of 600 tons per annum. The revised 1929 programme of one 'G' class (1,800 tons) and two 'S' class (650 tons each) provided evidence of the failure to take up even the limited tonnage allowed by the Conference. The Admiralty appeared satisfied to accept only three boats per year,[97] largely because financial provision for the whole of the construction programme was considered uncertain and the known attitude of the Treasury militated against a higher figure in what were considered 'exceptional circumstances.'[98] The Cabinet were also in the process of 'carefully' reviewing the situation resulting from the provisions of Part III of the London Naval Treaty, dependent upon its ratification by

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95. Alexander to Chancellor of the Exchequer, Philip Snowden, 28 Apr. 1930, ADM 116/3389.

96. D. of P., 24 Apr. and 8 May 1930, ADM 1/9728.

97. Alexander to Fighting Services Committee, 9 May 1930, ADM 116/2606, 'Naval Construction Programme, 1930.'

98. Snowden to Alexander, 12 May 1930, ADM 116/3389.

all the Conference Powers. 'As a result they do not consider that in the present international situation it is desirable at this moment to formulate general proposals covering the whole period of the Treaty or, in fact, to go beyond the present financial year.'[99] Apart from anything else the Government were then concerned to reach agreement with France and Italy on submarine tonnage and until something was achieved on that front the decision was that construction programmes could not be clarified for the period covered by the London Naval Treaty.

The 1929 and 1930 programmes were to be allowed to go ahead but the cancellation of three boats from the 1929 programme was confirmed.[100] Moreover, submarine construction under the 1930 programme was announced as only three boats and so ensured that submarine strength was at a dangerously low level. Although the Government still stubbornly favoured pursuing a policy of abolition the Admiralty emphasised that: 'Whilst other Powers retain the submarine weapon it must be retained by us.'[101] This resulted in the Admiralty's assessment of future submarine requirements being based on a comparison with the declared construction programmes of the other major Powers.[102] The problems of possibly having to increase destroyer tonnage to counter French submarine construction were also bound to cause uncertainty over what proportion of resources would be available for the submarine category. The shortfall between requirements and the number of patrol submarines in service was therefore accentuated by the

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99. Admiralty, June 1930, ADM 116/3389, 'Naval Construction Programme, 1930.'

100. Admiralty, 21 May 1930, ADM 1/8739/40, 'Supplementary Estimate for the 1929 Programme.'

101. Admiralty, June 1930, ADM 116/2606, P.D. 03584/30, 'Naval Construction Programme, 1930.'

102. Alexander to Fighting Services Committee, 8 Dec. 1930, ADM 116/2606, P.D. 03687/30, 'Naval Construction Programme, 1930.'

reduction of the projected construction programmes up to 1936. Prior to the London Naval Conference the Admiralty had estimates submarine requirements at 72 boats but the Treaty quota meant that this total was no longer feasible. There were 53 submarines in service (45,534 tons) and nineteen building (26,110 tons), matching the original requirement of 72 boats. However, 17,000 tons had to be disposed of to comply with the Treaty.[103] Estimates were that at least four submarines per annum would be needed to maintain an under-age force up to the Treaty tonnage. In fact it was not until 1936, following the negative results of the 1935 London Naval Conference, that the annual submarine construction rate rose above three.

The late 1920's had been marked by a constant reduction in proposed submarine numbers and following the London Naval Conference they were reduced even further. The force total was now to be as low as 40 submarines by 1936, which was half the total proposed in 1924-25 (when assumed annual wartime losses alone were assessed at sixteen boats). The A/S and destroyer force was in an equally difficult position with a total of only 150,000 tons. Problems would also arise if any need emerged suddenly to increase numbers since with the continuing decline in orders difficulties arose,

> 'with the Specialist Armament Firms as to maintenance of plant, in particular as regards Armour, Shell, Guns and Gun Mountings. Some of these questions cannot be settled without involving financial issues and the extent of these necessarily depends upon the productive capacity required to be maintained to meet Admiralty requirements.'[104]

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103. Rear-Admiral (S), Dunbar-Nasmith to Admiralty, 28 Aug. 1930, Submarine Archives H.M.S. 'Dolphin', 927/S.96, 'Scrapping of Submarines in Accordance with the London Naval Treaty.'

104. Admiralty, 9 May 1930, ADM 116/3747, P.D. 03567/30, 'Shipbuilding Policy in War.'

It was clearly going to be increasingly difficult both to keep current strengths up and provide for future building capacity. Additionally, the persistently high strength of foreign submarine fleets also ensured that the need to keep abreast of the latest submarine technology was a constant preoccupation.

Nevertheless, throughout the 1920's and well into the next decade, the effect of Treasury pressure caused annually a reduction in the resources allocated to the Royal Navy. This affected not only warship construction and development but also maintenance of bases and the level of essential stocks of fuel oil and munitions. The results of this cut-back meant that those categories of vessels considered less vital to naval policies were most vulnerable under this policy. Throughout this period, the cruiser (for defence of trade routes and communications) and destroyers (for fleet and convoy escort) were considered of prime importance (a building 'holiday' being declared on capital ships).

Under the leadership of Admiral Beatty the Admiralty had waged a strong rearguard action throughout the early and middle twenties against the financial and political pressures of successive Governments to reduce defence expenditure. Despite a tremendous effort they were largely unsuccessful. Beatty's retirement led to a void and the need for a period of resettlement while his successors coped with his absence. From 1920-1928, Beatty's presence as First Sea Lord had ensured continuity in the direction of the Naval Staff and naval policies. In addition to his war-reputation, Beatty was well-connected, influential and personable, with the result that if he had been driven to resign the Government would have been faced with serious political problems. The natural result was that no one could easily take Beatty's place, or command similar prestige and effect, more especially since he had been the last of the major wartime

'heroes' still in office. His retirement strengthened the Government's position in its relations with the Admiralty and diminished the Admiralty's influence during the period. Moreover, immediately after Beatty's retirement there was a reluctance by the Admiralty to overturn what he had done, if only because he had held office for so long; to admit to new policies, however necessary, was extremely difficult, not least within the Service. However, before these problems could be solved the Admiralty was forced to 'shelve' them due to preoccupation with the 1930 London Naval Conference. Only after its conclusion was it possible for the Navy to concentrate on rectifying its shape and size to meet the international situation. Beatty's successor, Madden, proved unable to match his predecessor in terms of personality. In mitigation it must be stressed that this would have been a difficult if not impossible task for anyone else at that time. Moreover, Madden had to take office at an extremely difficult time, while the Geneva Conference was still in session. Added to this was increasing Government pressure as the economic crisis deepened for further cuts in naval expenditure. Beatty had intended that Keyes should succeed Madden but the advent of the Labour Government in 1929 frustrated this proposal. The opinion of the politicians was that Keyes would be unsuitable to deal with the political requirements of the First Sea Lord's post. Moreover, doubts existed about Keyes's intellectual capacity for the job. One wartime colleague commented: 'Keyes is a fine fellow but is not blessed with much brains.'[105] Moreover, with the 1930 London Conference due the following year, the Labour Government were averse to appointing someone who would probably be intractable over the degree of disarmament the Government hoped to achieve. The result was the choice of Admiral Field, a man

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105. Jellicoe to Admiral Sir Frederick Hamilton, 9 Nov. 1915, Hamilton MSS, N.M.M.

not only in doubtful health but also described as one of the most colourless First Sea Lords of the period.[106] One of his first major acts was to approve the Government's plan to reduce the cruiser force from 70 to 50 as part of their proposals for the London Conference.

Although the failure to achieve international agreements had little effect on existing technical plans for submarine construction, the agreed qualitative limit of 2,000 tons clearly precluded development of large specialist submarines. However, the Admiralty was concerned about the possible effects of quantitative tonnage agreements. These threatened to reduce the revised plan for a force of 72 submarines, already shown to be inadequate, to only 40 boats. Since an estimate of 70 submarines had been made to counter any aggression in only the Far East the new total was clearly unrealistic. Moreover, the shortfall existed not only in theory but also in practice, as the existing force level was only 53, allied to a planned annual construction programme of no more than six submarines. On these figures the maximum force would never exceed 55 under-age submarines. But the indecision about which total was feasible provided a clear example of the malaise and uncertainty which gripped the Admiralty in the struggle with the politicians during this period.

More than at any other time since 1918 the submarine appeared to be expendable, considered a vital weapon only by the Submarine Service itself. Clearly, what would have been needed was a determination by both the Admiralty and Government to maintain submarine strength at a more realistic level but there was no consensus about the submarine in the Navy as a whole and the submarine had a low priority. On the other hand it could be argued that the survival of the submarine in the Royal Navy was now

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106. S. Roskill, Naval Policy Between the Wars, (London, 1968), 1, 48.

assured. The failure of successive abolition policies had resulted in the acceptance of limitation agreements as a more practicable contribution to the Government's disarmament policies, which now extended to all categories. Thus, although abolition had been proposed at the 1930 Conference, the main effort was restricted to tonnage limitation. Further evidence of the survival of the submarine was provided by the fact that destroyer and escort vessel tonnage quotas were now linked to quantitative limitation in the submarine category. This reflected alterations in British naval thinking, principally on the ability of A/S forces equipped with Asdic to counter the submarine threat. This question was to dominate British submarine policy in the period after the 1930 London Naval Conference.

CHAPTER 10

1931 - 1934

DOMESTIC SUBMARINE AND A/S POLICY

Despite a decade in which several naval disarmament and limitation agreements had been signed, British attempts to obtain international support for the abolition or rigorous limitation of the submarine had been frustrated, principally by the French. The years from 1931 to 1939 were to see acceptance of the futility of these policies and a gradual reassessment of British naval requirements. Impetus was provided by the knowledge that the United States, Japan, France, and Italy were all increasing their naval armaments. Moreover, evidence existed that, 'some of the smaller nations are either commencing or projecting the building of submarine flotillas which may constitute a much increased threat to ... naval security.'[1] The problem was compounded by the fact that Britain had accepted a level of naval armaments insufficient to maintain and protect wartime sea communications even on a modestly computed basis. Existing naval disarmament agreements were due to expire in December 1936 and the Admiralty held that unless there were considerable reductions in the French and Italian naval programmes, allied to further disarmament measures at the next Conference, a considerable increase in British naval strength was necessary. No more reductions could be recommended beyond a decrease in the displacement and gun calibre of capital ships and only if this was part of an international agreement. Nevertheless, British proposals for the 1932 League of Nations Disarmament Conference at Geneva were based on accepting that, 'the Washington and London Naval Treaties

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1. First Sea Lord, Admiral Sir Frederick L. Field to Three Party Committee, 1931, ADM 116/2826, D.C.(P.) 6, 'Appreciation of the General Naval Situation in 1931.'

'are the only practical steps which have been taken to limit armaments,' and, 'nothing should be done which would in any way compromise these Treaties.'[2] However, the Government's economic problems made it unlikely that 'anything' would be done, especially as disarmament agreements were considered valuable in relieving the burden of defence expenditure.

The low level of British naval strength emphasised the vulnerability of the nation which had to import large quantities of foodstuffs and raw materials. In Europe, France possessed the ability to be a potential threat through attacks on trade as,

> 'she has concentrated largely upon the submarine arm. The experience of the late war showed that the submarine is a weapon admirably adapted for attack upon the Empire's trade. The presence, therefore, of a powerful submarine fleet at our door merits serious consideration.'[3]

The geographical position of France was considered to facilitate attacks upon British trade routes, not only in the English Channel and the North Sea but also in the Mediterranean. Italy, however, was not thought a serious menace to British shipping, although well situated to be so in the Mediterranean, largely because she was herself vulnerable to maritime pressure. Germany also was not considered to constitute a major threat but the future appeared less comfortable as enforcement of the disarmament clauses of the Versailles Treaty became more difficult. German participation in the League of Nations Disarmament Conference was bound logically to lead to demands for equal treatment and parity in naval armaments with France.

Domestic Submarine Development

Meanwhile, the Admiralty had to oversee the reduction of the submarine

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2. Ibid.

3. ADM 116/2826, Field to Three Party Committee. (See Note 1.)

force to a level complying with the London Naval Treaty. This was necessary as part of preparations for the League of Nations Conference since Britain had to be seen upholding existing arms limitation agreements.[4] With a submarine building programme limited to three boats per year the problem was not one of overall numbers but of priority between types. This led to some extremely complicated schemes on how to use available tonnage.

> 'In order to build as fully as possible up to our treaty allowance, we could lay down three "G" class (1,800 tons each) in each of the years 1932 and 1933. It is necessary, however, to proceed with the early development of the,' minelayer, 'class, of which a new design is now being investigated. It is therefore proposed to include in the 1932 programme - two "G" class, one "M" class.'[5]

All proposals were dependent on finance and in the Government's view this meant reducing expenditure.

> 'The new programme for 1932 as now provisionally proposed is estimated to cost approximately £10,500,000,' all categories, '... In present circumstances, such a figure seems to be out of the question to ask for. I have therefore re-examined the programme and offer the following suggestions for reducing expenditure.' In the submarine category, 'Substitute one "S" type for one "G" type submarine. Programme will then become one "G", one Minelayer, one "S". Saving approximately £300,000.'[6]

Clearly, in this situation it was difficult to get support for additional submarine construction even on the basis of operational requirements.

In preparation for the Conference, the Cabinet authorised the

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4. Committee of Imperial Defence (C.I.D.), 1 May 1931, ADM 116/3204, 'Memorandum on Disarmament Conference - Reduction and Limitation of Armaments: Return of Naval Vessels Possessed by United Kingdom and British Empire.'

5. D. of P., Aug. 1931, ADM 116/2606, '1932 Naval Construction Programme.'

6. Third Sea Lord, Vice-Admiral Sir Roger R.C. Backhouse to D. of P., 12 Oct. 1931, ADM 116/2606, P.D. 03921/31, '1932 Construction Programme.'

establishment, on 6 October 1931, of an Inter-Departmental Committee[7] to act as a sub-committee of the C.I.D. Among its first tasks was consideration of a Naval Staff memorandum on the navies of the major and minor Powers in relation to disarmament negotiations. A new problem was expected to arise as this was to be a general Conference and not a select grouping of major Powers. The smaller naval nations, handicapped by limited financial resources, were expected to concentrate any new development on smaller warships, especially submarines. Therefore: 'It seems probable that the question of the limitation figure for submarines will prove one of the most difficult points on which to get agreement.'[8] Among other proposals it was suggested that submarine tonnage could be kept down by the abandonment of projected rather than existing construction programmes or scrapping over-age boats. This would have given the best return for Britain by limiting small submarine fleets for several years ahead and forcing increased dependence on over-age tonnage. Despite the fact that these proposals were, 'very likely to prove unacceptable ... it was considered that they should be pressed,' because: 'The Admiralty cannot view the development of such submarine forces with equanimity, and it is considered that a strong stand be taken against such development.'[9] A strong stand was certainly possible but in the face of the known views of the other Powers was an empty gesture.

France was expected to continue opposition to submarine abolition or limitation and presented a two-fold problem for Britain. The French had to be persuaded to accept reductions in overall tonnage, which seemed

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7. Naval representatives were: Vice-Admiral Dreyer (D.C.N.S.), Vice-Admiral Pound, and Captain T.S.V. Phillips.

8. Field to Reduction and Limitation of Armaments Policy Committee, 6 July 1931, ADM 116/2611.

9. Ibid.

impossible, and simultaneously the Admiralty had to consider the effect of and the measures necessary to counter such a force.

> 'The Submarine ... hampers enormously every operation in any area in which it may be found - ships have to zig-zag, heavy or valuable ships have to be screened, high speed has to be maintained - all of which reduce endurance. Further, a vast mine-sweeping and anti-submarine organisation has to be set up, and generally the mere possibility of the presence of submarines renders necessary the expenditure of immense additional effort in order to obtain even a reasonable degree of immunity from casualty.'[10]

Despite a decade and a half of development the use of Asdic was coming to be seen not as a complete answer to the submarine but merely a means of blunting the weapon. Even this could only be achieved at prohibitive cost in A/S vessels and specialist crews. The French were talking of a submarine force of 125,000 tons and the Admiralty found it difficult to reconcile such a large tonnage solely with defence of North African troop convoys. Nor were they placated by French announcements that their submarines were required for coast defence.

> 'Furthermore, British war experience by no means proves that the submarine is a particularly suitable type of vessel for coast defence purposes.' The logical conclusion was, 'that French insistence on such a large submarine tonnage is due to an intention to use these submarines in a future war as an offensive weapon against surface vessels of the enemy Navy and Merchant Marine.'[11]

The possibility of French attacks on British Merchant shipping could not be entirely ignored if only because of the size of the French submarine fleet. However, in terms of naval planning such a threat was considered mainly in relation to contingency war plans. The problem of extravagant

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10. ADM 116/2826, Field to Three Party Committee, 6-7. (See Note 1.)

11. Naval Staff, 29 June 1931, ADM 116/2611, 'The Submarine Menace,' 13.

French submarine construction and its effect on encouraging other naval Powers created financial pressures on Britain to increase her A/S forces. Overall, as a European Power with a moderately sized Fleet, France had to be included by naval planners as a possible major threat. Principal reasons, in addition to the large submarine force, included outlets to the Atlantic and the Mediterranean as well as a surface fleet to support the submarine force. In general terms, France posed more of a naval threat than Italy and represented in the Admiralty's opinion the type of threat in the 1920's and early 1930's that a re-armed Germany posed in the middle and late thirties. To that extent it represented a prudent 'norm' against which to provide. Moreover, the naval staff could not afford to lightly dismiss not only France as a threat but also the U.S.A. and Italy. There had been no continuation of wartime co-operation after 1920 and no specific treaty provisions existed to allay fears. The notion of permanent international co-operation played no part in the inter-war environment, even allowing for the fitful existence of the League of Nations. In some respects, the totally different concerns and preoccupations of the European States after the Second World War, that stand in such sharp relief, represent something of a determination not to be put on such tenterhooks again.

Admiralty Position on Convoys

In searching for a means of countering the submarine threat to commerce the Admiralty recognised that not only had the U-boat campaigns of 1917-18 come close to success but also that, 'the adoption of convoys was a very important factor in the defeat of her,' (Germany), 'unrestricted attack on trade.'[12] The advantages of the convoy system were realised but the Admiralty remained unconvinced that this alone provided

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12. Ibid, 15.

a reasonable safeguard against the submarine and continued to favour a system of independent sailings. One reason was the time needed on the outbreak of war to increase the number of A/S vessels and crews. To attempt to maintain a large enough force in peacetime was considered ruinously prohibitive, as was equipping merchant shipping with defensive armament. In addition, until the late 1930's the main naval assumption was that Japan, not Germany would be Britain's main enemy in a future war. Therefore, the problems centred on moving fast troop convoys to the Far East and not slow merchant convoys across the Atlantic. However, extensive plans could be worked out to ensure that the actual collection and routing of convoys would commence with the outbreak of a European war, if unrestricted submarine warfare necessitated them. Nevertheless, these were major reasons for attempting to abolish or limit the submarine, especially since as a regular warship it possessed the advantage of readiness for war. This argument, however, depended on accepting that the submarine was not only a cheaper vessel to construct and maintain than an escort vessel but also that a Navy possessing submarines as a major strike force would not have the need to maintain A/S forces. Britain remained vulnerable because her large merchant fleet left her no alternative but to provide protection against both surface-raider and submarine.

However, in 1931 Asdic had still not been sufficiently developed to be used under all sea conditions and the conclusion was that,

> 'good results can only be obtained from this apparatus in moderate sea weather conditions at moderate speeds and with very well-trained personnel, whose efficiency deteriorates somewhat rapidly after periods of watch-keeping, which is a most exacting duty.' The assessment of the strength of such forces in the Royal Navy led to the conclusion that: 'The number of vessels fitted with efficient submarine detecting apparatus which would be available at first to escort individual convoys is likely to be so limited as to provide very little

> 'protection from torpedo attack to a convoy covering a large area, and only a chance of successful reprisal, which is often a long and difficult operation.'[13]

Various exercises had been carried out as a means of improving the A/S escorts dispositions in the defence of convoys. The most advantageous positions were concluded to be ahead, abeam, and on the quarter or astern of the convoy and from these, escorts could: 'Carry out a prompt counter-attack on any submarine attacking the convoy,' and; 'Detect an attacking submarine prior to her firing torpedoes at the convoy.'[14] Optimum defensive positions for A/S escorts could alleviate slightly the problem caused by shortage of numbers but the only efficient remedy lay in the provision of adequate numbers of such escorts. However, this was partly a political problem since such a solution would have required a large increase in the Navy Estimates, at a time when all categories, especially capital ships, required replacement as well as expansion. In addition, a large amount of specialist manpower would have been needed and the domestic political climate was still considered unsuitable for rearmament measures, despite the relief construction orders would have created for unemployment in many depressed areas. The Admiralty's arguments for more A/S escorts were not helped by the fact that, as in the late 1920's, the exercises from which these conclusions were drawn were still extremely artificial. The 'convoys' travelled at 15 knots, compared to the 7 knots of an average merchant convoy, which would have allowed underwater attack with submarines capable of 8-9 knots for limited periods submerged. On the surface, submarines were fast enough to overhaul merchant convoys and repeat a

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13. ADM 116/2611, 'The Submarine Menace,' 16. (See Note 11.)

14. Tactical Division, July 1932, ADM 186/491, 'Progress in Torpedo, Mining and Anti-Submarine Warfare 1931 (P.T.M.A.S.),' 33.

submerged attack. Moreover, 'convoy' exercises were infrequent and concentrated on providing practice for the Asdic equipment. The shortage of destroyers was a major reason for this infrequency. In addition merchant ship owners were probably reluctant to withdraw their vessels from profitable trade to take part in exercises, and exercises continued to be based on the scenario of a fast troop convoy escorted by ample numbers of surface and A/S escorts. No awareness was shown of the possibilities of night attacks by submarines on the surface where the Asdic echoes could not detect them. Although a large number of U-boat attacks in 1917-18 had been made under these circumstances, the outbreak of war in September 1939 found the Royal Navy unprepared for and initially vulnerable to such tactics. Part of the reason stemmed from a ban on submarine night operations, which had been imposed for safety reasons, and was not relaxed until 1936-37 and then only in the Mediterranean.[15] Nevertheless, since Dudley Pound was then C. in C. in that area (and later First Sea Lord early in the war), the Navy in 1940 should have been aware of the ineffectiveness of Asdic against submarines on the surface. No such clear warning existed on the use of 'wolf-packs', especially as the effectiveness of this tactic was increased by the unforeseen event of the U-boats acquiring the use of bases on the French Atlantic coast. Moreover, the Royal Navy appeared to show greater enthusiasm for the traditional 'hunting-group' system of A/S operations than for the methods of the screening force,[16] despite the evidence of the First World War that it was easier to detect submarines by protecting a convoy than by scouring thousands of square miles of ocean. Asdic possessed such a limited range that a submarine could be easily

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15. A.J. Marder, From the Dardanelles to Oran, (London, 1974), 46.

16. ADM 116/2611, Field to Reduction and Limitation of Armaments Committee. (See Note 8.)

missed except in close proximity, i.e. when attacking merchant ships in convoy. Much of the enthusiasm for the 'hunting-group' method lay with the Navy's traditional belief in the offensive. The Second World War proved again that the 'hunting-group' could provide a useful adjunct to the convoy system but this view assumed a surplus and not a shortage of A/S vessels. The result was a diversion of valuable A/S escorts away from convoys to undertake futile 'offensive' patrols by 'hunting-groups'. Convoy escort duties were regarded by many officers as dull and monotonous measures and command of a fleet destroyer was considered a greater prize. The logical result was that the majority of the best commanders were assigned to the fleet rather than convoy escorts. There were also the threats from surface raiders and aircraft to be considered. Convoy exercises more often concentrated on these threats than on that posed by the submarine. Air attack was considered more relevant where convoy routes passed close to hostile territory. The view on the use of aircraft to supplement the A/S forces was that:

> 'During the Great War Allied aircraft only effected the destruction of seven out of a total of 188 enemy submarines destroyed. Subsequent fleet experience points to the fact that the potentialities of aircraft in this respect have not materially altered, but they have extended their capabilities for reconnaissance, and this should help to increase the chances of attack on the submarines by vessels fitted with Asdics.'[17]

However, in 1939, no suitable aircraft were available, largely because the responsibilities of naval aircraft did not include the protection of maritime shipping. The absence of long-range aircraft and escort carriers had grave consequences during the early years of the war. The situation was largely the result of the limited interest and priority given to convoy

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17. ADM 116/2611, 'The Submarine Menace,' 16. (See Note 11.)

during the inter-war period.

The problem of surface-raiders was a traditional one for the Royal Navy, although it had not affected the initiation of the merchant convoy system in 1917; the German surface-raiding forces had long since disappeared. The emphasis on the surface-raider threat had increased with the laying down by Germany of the first of the 'pocket battleships'. The ideal role for these vessels was clearly against merchant shipping. The only British warships combining the necessary speed and superior gunpower to defeat such opponents in a single ship action were the ageing battle-cruisers. A combination of convoy, Asdic, and submarine limitation agreements would hopefully counter the underwater threat but the belief remained that the only measure which could ensure safety from submarine attack was abolition. Meanwhile, in terms of numbers, the situation was serious in both categories of escort vessel - the destroyer versus the submarine and the cruiser versus the surface-raider. In 1918, Britain had possessed 116 cruisers and 433 destroyers, while the projected figures for 1936 were 50 and 120 respectively. The message presented to those charged with British naval policy was that existing and proposed force levels were too low to provide even the minimum level of naval protection in a future war. Abolition of the submarine would have provided a solution but: 'It appears likely that the best we can hope to achieve at the 1932 Disarmament Conference is to get a reduction of submarine tonnage for various Powers, and it is very important that the French total submarine tonnage should at any rate be reduced to equality with our own.'[18] However, there was no likelihood of success over persuading the French to accept reductions in their submarine force or agree to Part IV of the London Naval Treaty which they

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18. ADM 116/2611, 'The Submarine Menace,' 18. (See Note 11.)

had already refused to ratify, and which the Admiralty now wished to see incorporated as an integral part of the Disarmament Convention.

Geneva Disarmament Conference - 1932-33

The League of Nations World Disarmament Conference opened in February 1932 with the Admiralty continuing to advocate submarine abolition publicly, despite being aware that there was little hope of France or Japan agreeing. Opposition from the smaller Powers was based on their consideration of the submarine as a valuable weapon for coast-defence. The British rejected this reason but had to admit that it was impossible to prove that the presence of submarines did not hamper and complicate enemy naval movements. Meanwhile, in order to strengthen the case for a major reduction in qualitative tonnage, studies were made, 'to investigate whether a submarine tonnage could be found below which the vessels would be quite suitable for the coastal operations ... but too small for extended operations against trade overseas.'[19] However, investigation of both British and German wartime records showed that submarines of approximately 600 tons had operated efficiently in the North Atlantic, while boats of 300 tons had proved suitable in the Mediterranean. Therefore, a, 'figure of 250 tons standard displacement (340 tons submerged) provided the only possible dividing line between vessels suitable for the two types of operations.'[20] Evidence from previous disarmament negotiations, however, showed clearly that the other Powers favoured a qualitative limit of 2,000 tons maximum and 600 tons minimum, rather than a standard 250 tons. Meetings of the Conference Naval Commission soon confirmed this and although a number of nations favoured qualitative tonnage restriction they were not prepared to consider a lower limit than 600 tons.[21]

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19. Admiralty, 1933, ADM 116/2827, 'Papers on the League of Nations Disarmament Conference, 1932-33.'

20. Ibid.

21. Vice-Admiral Pound, 25 May 1932, ADM 116/3617, D.C./044.

The nature of the Conference, concerned with areas of disarmament other than naval items, tended to complicate the possibility of agreement on relatively small points such as qualitative submarine tonnage. Thus attempts to reach a common upper tonnage limit for submarines were delayed pending wider discussion on defining 'offensive' and 'defensive' weapons of war. These negotiations revealed, 'a mass of opposing views, each nation seeking to prove that the weapons they favoured were defensive whilst those they did not possess were offensive.'[22] It could be added that nations were also opposed to any weapons they did not consider vital to their requirements but that were felt to be a danger when possessed by other Powers. British naval policy remained centred on the need for surface command of the sea. Failure to achieve or maintain it meant defeat. Traditional naval supremacy was achieved by the defeat of the enemy fleet. However:

> 'The submarine is the only vessel which can operate without support and in the face of general surface command being held by its enemy ... The submarine is consequently able to disturb our general command of the sea in a manner that no other type of vessel can do. To us, on the other hand, the submarine is of no value for controlling the distant areas generally, because:- (a) We can control enemy trade in these areas more simply and cheaply by the use of surface ships. (b) It is unsuitable for defending trade.'[23]

Nevertheless, the submarine was useful to Britain in, 'a few areas in any particular war where our surface vessels are unlikely to have control, as in the Baltic in 1914-18 owing to Germany's possession of the Kiel Canal.'[24]

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22. 'Naval Disarmament' (An account of the Geneva Conference), Feb. - June 1932, ADM 116/3617, 1-2.

23. British Commonwealth Delegation, 18 Feb. 1932, ADM 116/3617, 'The Role of the Submarine in Defence,' 2-3.

24. Ibid.

The British were anxious to avoid becoming involved in the general argument on differentiation between 'offensive' and 'defensive' weapons, being,

> 'convinced that ... any attempt to regulate disarmament on the assumption that distinction can be drawn between offensive and defensive weapons must prove not only abortive but the precursor of unfruitful argument and international ill-feeling.'[25]

Therefore the case for submarine limitation was to concentrade purely on securing as low a qualitative tonnage as possible irrespective of whether this weapon was considered offensive or defensive. Pressure from the other Powers meant that a figure less than 600 tons (standard) could not be considered. If such a limit could be regarded as the maximum size then there were advantages for Britain but this was to ignore the disadvantages to British submarine operations. Overseas patrols using boats with this tonnage limit were still considered feasible but only if bases were available. Such facilities were available in the European area and this concept had provided the basis for the design philosophy of the new 'S' class patrol submarines. However, this type were precluded from most Far East operations by their limited endurance. Nevertheless, in the hopes of reducing expenditure in the A/S sector the British view remained that:

> 'If we cannot get abolition of the submarine, we should support the limitation of the type to such a size that they are really of use for defensive purposes only (if such a size can be found) ... using the argument that we must stick to the tonnage which really draws the line between offensive and defensive submarines.'[26]

Nevertheless, even if such a limit were accepted, then efforts would be made to reduce quantitative tonnage in order to prevent an increase in

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25. D. of P., 8 Mar. 1932, ADM 116/3617.

26. Pound, 22 Feb. 1932, ADM 116/3617, D.C./S.010, 'Submarines - Reduction in Size,' Enclosure No. 1.

numbers. But, no matter how far nations were prepared to reduce their submarine tonnage there was no way of preventing the return of larger submarines in wartime. However, the hope was that this sort of measure would allow enough time for the Royal Navy to expand its A/S forces.

The Admiralty preferred the 250 tons limit but realised that this was unlikely to be achieved. 'You are not to initiate proposals to effect a reduction in the size of submarines, but may support any such proposal.'[27] Moreover, in all moves made by the British delegation they were to ensure that the provisions of the Washington and London Naval Treaties were not affected. This was in line with Admiralty policy to extend the London Naval Treaty to include France and Italy.[28]

Hughes Proposal

The Conference had made no progress on submarine limitation when on 22 June the United States proposed that the maximum qualitative tonnage should be reduced to 1,200 tons and that no nation should possess more than 35,000 tons in the submarine category. The opposition presented by France and Italy was hopefully to be overcome by calculating their tonnage as if they had signed the London Naval Treaty on the basis of the abortive Franco-Italian Agreement of 1 March 1931. British reaction to these proposals was that:

> 'Relating the British proposal in regard to size with the United States proposal in regard to numbers would produce a total tonnage in the Submarine category of 10,000 tons, or 25,000 tons below the United States proposal. The U.S.A. proposal, however, goes some way towards securing a substantial reduction in numbers of Submarines,

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27. Admiralty to Pound, 2 Apr. 1932, ADM 116/3617, M.0460/32, 1.

28. Plans Division, 23 June 1932, ADM 116/2827.

> 'and though not as far-reaching as the British proposal, it cannot be altogether objected to.'[29]

There was little choice in this decision since none of the other Powers were prepared to consider the low qualitative limit of 250 tons. However, additional proposals were forwarded by the British, tailored to fit their own requirements. These included a prohibition on submarine construction and a reduction of one-third in destroyer tonnage.[30] Although officially continuing to favour abolition, the British were prepared to accept the American proposal that there be a maximum limit of 40 submarines per nation. None of the other Powers, however, favoured the proposed qualitative limit and the French continued to refuse to reduce their total tonnage. The United States were still prepared to make appropriate statements in support of the British abolition proposals but in practical terms the major effort was expended on achieving a reduction in the quantitative tonnage limit.

> 'As regards submarines, Admiral Hepburn re-iterated their desire for total abolition. If they were to be retained, however, they would want something larger than 250 tons. His idea seemed to be that a limit should be put on numbers and total tonnage. Individual tonnage might be left free since, as the Italians pointed out, it would be an advantage,' to Britain, 'if a nation elected to put all its tonnage into a few large submarines.'[31]

The withdrawal of the German delegation on 16 September effectively stopped all further progress on naval questions.

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29. Sir John Simon (Foreign Secretary) to British Embassy (Geneva), 22 June 1932, ADM 116/2827, 'Hughes Proposals.'

30. ADM 116/3617, 'Naval Disarmament.' (See Note 22.)

31. Admiralty, 15 Nov. 1932, ADM 116/2827, 'Documents on the League of Nations Disarmament Conference, 1932-33: Results of Private Conversations Between Representatives of Powers as to British Disarmament Proposals of 21 Oct. 1932.'

The Admiralty's concern about the German claim for equality was largely related to German re-acquisition of the submarine, although the question of capital ships and heavy cruisers was not ignored. The problem was how to exercise some control over German naval rearmament while accepting that such a policy was inevitable if Germany was granted equality of political status. The recommendation was that Germany be brought into an international agreement which would allow the Germans the right to build large surface warships and free them from the prohibition on submarine construction. In reality Germany would be only qualitatively, 'on the same basis as other Powers and she would not be able to build up a force of submarines of any size because a condition of the agreement was to be that she should accept little or no increase on the Versailles quantitative figures for the present.'[32] It involved the gamble that Germany would continue to adhere to such an agreement. Recognising that the inevitable increase in pressure from the Germans for release from the disarmament clauses of the Versailles Treaty might lead to unilateral action, the best solution was considered to be to persuade the Germans to an agreement with limitations on tonnage rather than risk no agreement at all. On the question of submarines, the Admiralty accepted the proposal to lift the total prohibition subject to the condition that: 'It should also be part of any agreement that Germany accepted the limitations of Standard Category System, which would not permit transfer from surface craft to submarine tonnage.'[33] The decision to officially approve Germany's re-acquisition of submarines may appear to have been a strange decision to make at a time when it was being stated that the convoy system, even supported by

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32. D. of P., June 1932, ADM 116/2827, P.D. 04106/32.

33. First Lord, Viscount Monsell to Cabinet, 29 June 1932, ADM 116/2827, 'Note on Disarmament.'

A/S escort forces was no guarantee of safety against the submarine.[34] However, the Admiralty concluded that there was a need for an overall naval agreement including Germany. The alternative was the possible collapse of the Washington and London Naval Treaties, under the pressure of a naval building race. Such a development would have spelt the failure of a decade of continuous activity on disarmament by successive British Governments. The nation was not prepared for that consequence nor possessed the capability to undertake major construction programmes except over a lengthy period. In addition, the Navy could not rapidly absorb the numbers of resultant vessels. The best that could be hoped for was that continued development of Asdic would increase the degree of safety of convoys despite a continuing shortfall in the available number of escort vessels. Nevertheless, any failure to agree on definite naval limitation proposals at the 1932 Conference would mean that no immediate agreement, which also included the other Conference Powers, was possible with Germany. Not until 1935 was it to prove possible for Britain to conclude a bilateral Anglo-German Naval Agreement, including provision for the construction of submarines.

Overall British policy at Geneva was to do nothing which would affect the existing naval disarmament treaties.[35] Moreover, American policy sought to strengthen the status-quo by gaining the adherence of the French and Italians to the London Naval Treaty.[36] The result was that the Geneva Conference settled, in the later months of 1932, into a forum for cementing the provisions of the London Naval Treaty in preparation for the projected 1935 Naval Conference rather than for creating any new

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34. ADM 116/2611, 'The Submarine Menace.' (See Note 11.)

35. Monsell, 24 Mar. 1932, ADM 116/3617, 'Meeting of 16 March.'

36. ADM 116/3617, 'Naval Disarmament,' 10. (See Note 22.)

agreements. British attention turned to the United States proposals since if successful these were seen as providing the chance to obtain reductions in French submarine tonnage. However, the British considered the existing proposal to reduce the French to 70,000 tons as inadequate in relation to the London Naval Treaty. Although in 1931 they had agreed to accept the French figure of 81,000 tons plus, this had been on the understanding that the total would be revised downwards at the Geneva Conference. Despite the negative achievements on this issue and the general desire by France for increased naval armaments the Admiralty still considered the existing policy justified. If agreement could not be reached then early consideration of the British position on Article 21 of the London Naval Treaty was required. This Article allowed an increase in tonnage, 'in one or more categories if the requirements of national security are materially affected by the new construction of any power not a party to the limitations of the Treaty.'[37] The 'Escalator Clause' had originally been framed to counter any French refusal to reduce her submarine tonnage to the 52,700 tons of the London Naval Treaty. The United States was concerned to include France in the Treaty, even with a higher submarine allowance of 70,000 tons, in order to avoid the perceived dangers of tonnage escalation in other categories. Article 21 applied only to the actions of non-signatory Powers and French assession to the Treaty would remove the escalation danger. The advantage to Britain of any French agreement was largely economic in allowing the Government to avoid having to find resources for an increased destroyer tonnage.

By December 1932, the French were aiming for a figure of 96,000 tons, in addition to submarines authorised under the London Naval Treaty already

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37. ADM 116/3617, 'Naval Disarmament', 14-16. (See Note 22.)

being laid down and which could no longer be regarded as new construction. Despite Britain's 'official' rejection of American proposals to allow France 70,000 tons, the Admiralty considered that the French would accept less than 76,000 tons. However, even this total could only be achieved if there was no further construction and all over-age boats were scrapped. Such an agreement was expected to result in Japan claiming an increase in her submarine tonnage, perhaps to the level of the French force, and as a response to any escalation of British destroyer tonnage. The net result would have been to destroy the status-quo. As a compromise solution, pending the possibility of an agreement with the French before the end of the Conference, the British proposed that they slow down their over-age scrapping programme for destroyers since the 150,000 tons total did not have to be achieved until December 1936. Existing destroyer tonnage was 181,000 tons, of which 124,000 tons was over-age. Thus an increase could easily be created without adding to existing construction programmes and invoking Article 21.

New proposals by Britain in March 1933 involved submarine tonnage totals being tied in with an attempt to gain a compromise acceptance of the London Naval Treaty by France and Italy.[38] Under this system Treaty Powers were to remain subject to the Washington and London Naval Treaties but France and Italy would only have to ratify those parts of the London Treaty which they had already signed. However, this meant there could be no further submarine construction by these countries until the Treaty expired in December 1938. The hope was that the next naval conference would then ensure a further period of naval limitation. Any prospect of success was eliminated when on 12 June Britain further amended the tonnage

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38. British Commonwealth Delegation, 16 Mar. 1933, ADM 116/3291, 'Draft Convention Submitted by United Kingdom Delegation.'

proposals so that: 'Until December 31, 1936, France and Italy will arrange their present submarine building and scrapping programmes, so that on the said date, their completed tonnage will not be greater than 52,700 tons.'[39] Thereafter, no progress was made with the French, despite the Italians agreeing to accept the submarine total laid down in the London Naval Treaty. This was conditional on the unlikely event of the French accepting the Italian naval tonnage demands. The Conference continued until 1934 but with no success. The international political situation had also deteriorated and the proppects for a successful naval conference in 1935 appeared to be threatened.

Domestic Submarine Construction

New naval construction was dependent on the decisions reached at Geneva. The quantity of over-age vessels to be scrapped under the London Naval Treaty had by 1933 turned into an annual problem. This was largely the result of juggling resources prior to each Navy Estimate. Further complications were added by the shortage of trained crews caused by the continued rundown of the submarine force. The situation by March 1932 was so grave that: 'In order to provide the personnel for "Swordfish" and "Sturgeon", the first of the "S" class, it will be necessary to place certain submarines in Reserve.'[40] This made it necessary to take a similar number of boats and place them in the Material Reserve, for scrapping. This would then be in excess of the planned scrapping programme under which the total submarine tonnage, including new construction, would comply with the London Treaty quota by December 1936. The

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39. British Commonwealth Delegation, 12 June 1933, ADM 116/3266, 'Article 27 of Revised Draft Convention.'

40. Rear-Admiral (S), C.J.C. Little to Admiralty, 14 Mar. 1932, Submarine Archives, H.M.S. 'Dolphin', 96/A.S., M.0270/32.

tentative scrapping programme for 1932-33 was fixed at seven submarines but even this was expected to lead to a shortfall in total tonnage since only six new boats were authorised.[41] Therefore, no disposals total was set until progress with the 1931 construction programme was clear. Originally this programme had been designed so that total tonnage would not exceed 52,700 tons. However, the latest figures showed that by 1935, twenty boats out of a total force of 51 would be over-age. An additional problem was that the submarine, because of its specialist nature, was recognised as only being safe for a strictly defined length of service life. Any extension of this 'life' meant the possibility of increased hazards. The Admiralty's attitude towards the submarine could not be divorced from consideration of the requirements for overall British naval policy, which the deteriorating international situation was only gradually to alter when it became clear that tonnage limitation agreements were under threat of breaking down. Evidence showed that even the United States had constructed more submarines than Britain since 1918 and the the other major naval Powers had constructed twice as many or more. The note of warning was clear.

> 'The reduction of our total of submarines to 39 in 1936 is a disturbing factor: We ended the last war with 140 submarines and in 1928 a total of 79 submarines was considered the war requirement (P.D.03027/28). The reason for the acceptance of a submarine tonnage of 52,700 at the London Conference is appreciated, but is it the fact that our war requirement for submarines has materially altered.'[42]

British support of American proposals, in 1932, for a maximum national force of 40 submarines, indicated that political factors dictated war

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41. Plans Division, 17 Feb. 1932, ADM 116/2949, 'Tentative Scrapping Programme.'

42. Ibid.

requirements and that these were now considered to have materially altered. The evidence of political ascendancy and military decline, in the relationship between Government and Admiralty, during the late twenties and early thirties, was confirmed in the decision to maintain adherence to the London Treaty quota in the submarine category despite all the evidence of increases in foreign submarine strength and the need for a larger British force.

With no political and economic support for the old policy of building ship for ship, maximum utilisation had to be made of existing resources in planning for new construction. Moreover, whatever the political policy on this issue the existing defence requirements continued to provide a major influence in dictating the direction of development within each warship category. In the case of the submarine the question of a further limitation of resources, for whatever reason, was not a new situation and the response had been a concentration of development on one type, the patrol model.[43] On the subject of British requirements for this vessel it was accepted that a larger design than the new 'S' class was needed, especially in the Far East.[44]

> 'The size of submarine required for distant reconnaissance in our case is complicated by the climatic conditions in the Far East. Whereas a submarine of 600 to 800 tons (our "E" and "L" classes) could carry out this function admirably in European waters, it has been found that the necessary degree of habitability involving inter alia, cooling plant for crew spaces and for the battery requires a tonnage of 1,475 tons as in our "O", "P" and "R" classes.'[45]

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43. See Appendix: G(10).

44. See Appendix: G(11).

45. Little to Admiralty, 11 Mar. 1932, ADM 116/3617, M.o460/32, 'Proposals for Limitation of Submarine Size to 250 tons.'

The First Sea Lord, Admiral Field emphasised however that additions to existing programmes were precluded, largely because of the 'abnormal financial situations.'[46] Certainly, Admiralty acquiescence in this situation implied no short-term improvement in British submarine strength. In July 1928 the requirement had been for 72 submarines but by 1933 this total had almost halved. Compliance with the London Treaty could be held responsible for much of the decline in the size of the force. In addition successive Governments could be fairly blamed for pursuing a political policy of tight financial stringency but this ignored the Admiralty's part in accepting such a policy of tonnage reduction. Admiral Chatfield confirmed this in 1937 when, in a memorandum to the C.I.D., he stated that: 'It is necessary for the first time for many years to consider our submarine requirements on a strategical basis. The submarine strength required by a country is almost entirely independent of the submarine strength of other countries.'[47] Meanwhile, requirements for submarine types had changed but to a certain extent these had cancelled out each other's effect. Increases in the size of new submarines caused a rise in their cost and, in the atmosphere created by shortage of hulls and financial restriction, the emphasis was diverted even more to meeting the overall tonnage quota with smaller submarines. However, it was necessary to go one stage further to make the new force total of 40 submarines appear satisfactory even on paper. This necessitated an optimistic and hypothetical view being taken of the potential wartime strain that the British submarine force was likely to undergo. The result was the acceptance of

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46. Field to Little, 1932, ADM 167/87, C.P. 444/32, 'Programme of New Construction for 1933.'

47. Admiralty to Defence Plans Sub-Committee C.I.D., 29 Apr. 1937, Cab. 27/648, D.P.(P) 3, 'A New Standard of Naval Strength,' 16.

the assumption that, for planning purposes, war would occur only in one area (Europe or the Far East) at any one time. Even then, in the worst situation, the projected force level could only be considered as barely sufficient,[48] which also ignored the 1925 memorandum on 'Shipbuilding Policy in War'. This document had calculated an annual replacement figure in wartime of sixteen submarines and an initial total force of 80.[49]

Within the ramifications of this tortuous policy, development continued slowly towards producing a design for the new medium size patrol submarine ('T' class). A prime directive was to keep the tonnage of this design as low as possible (1,100 tons instead of 1,400 tons) in order to now allow a total force of 49 submarines.[50] However, any increase in armament meant a larger boat. Submariners favoured greater offensive power while there were others who held that: 'The ability to attack, undetected, is considered to be of such importance that even a reduction of offensive power is considered reasonable if this would result in still further reductions in size.'[51] Despite these differences, it was accepted that the unsatisfactory performance of the 'G' class in the patrol role emphasised the need to produce a new medium patrol submarine design as quickly as possible, and to include the first boat in the 1935 Estimates.

The increasing concentration on production of the patrol model reinforced the need to gather as much material as possible on the use and efficiency of this type of submarine in a future war. The conclusion was to confirm the main roles as consisting of operations in enemy waters

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48. Plans Divison, Dec. 1933, ADM 1/9728, P.D. 04411/33, 'Submarine Building Policy.'

49. Plans Division, 8 May 1925, ADM 116/3747, P.D. 02229, 'Shipbuilding Policy in War.'

50. See Appendix: G(12).

51. D. of T.D., 10 Jan. 1934, ADM 1/9728, P.D. 04411/33, 'Future Submarine Building Policy.' (Endorsed by D.O.D., 16 Jan. 1934.)

(reconnaissance and minelaying) and anti-warship patrols[52] but not anti-commerce patrols as such targets were expected to be rare and accounted for by the cruiser force early in any conflict. The Admiralty was also concerned to adhere to existing international submarine limitation agreements such as the Root Resolutions and Part IV of the London Naval Treaty. However, continuing increases in A/S weapons and tactics were expected to be found in foreign navies. An exception to this belief existed over Asdic, since it was considered that the peacetime improvements had given Britain a good lead. Developments of this device, for use in submarines, were expected to give British submarine forces a valuable aid against foreign A/S forces. Nevertheless, the expectation was that British submarines would have to attack warship targets from longer range than had been the practice during the First World War, in order to reduce contact with the escort forces to a minimum. The range of Asdic had so increased that submarines were instructed to assume that within 4,000 yards of the target they were to adopt anti A/S screen penetration tactics.[53] Thus with torpedo ranges being officially quoted as a maximum of 5,000 yards[54] the problem lay in the divergences which could creep into a torpedo's course as it neared the end of its run. The result was an increase in the bow torpedo salvo from six to eight tubes in order to ensure a hit.[55] However,

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52. Rear-Admiral (S), N.F. Lawrence to Admiralty, 21 Feb. 1934, ADM 1/9728.

53. Tactical Division, 1933, ADM 186/499, 'Instructions for Submarine Operations,' Para. 129.

54. Tactical Division, 1933, ADM 186/498, C.B. 1904, 'Theoretical Investigation: The Use of the Torpedo in Action.'

55. Tactical Division, 1933 and 1934, ADM 186/154 & 155, 'Exercises and Operations.'
See also: Rear-Admiral (S), 1934, ADM 116/3872, 'Summer Cruise Exercise Reports.'

acceptance of this alteration led to a resurrection of the question of whether qualitative displacement was to be determined by operational requirements or Treaty regulations. Acceptance of tonnage limitation meant that ways had to be found of augmenting the operational submarine forces in wartime, if losses should prove high. Clearly it was,

> 'unlikely that the Commander-in-Chief would be satisfied to keep submarines of (say) the "Thames" class tied to his fleet month after month waiting for a contact with the enemy fleet which may never take place. He will almost certainly use these larger vessels to supplement the smaller ones on patrol, for which work owing to their great size they are not so suitable ... instead of building more "Thames" class it would be preferable to use the tonnage in a larger number of smaller submarines.'[56]

It could be argued that the 'Thames' class would prove useful in the immense distances of the Pacific but even in that area their usefulness was hampered (if used on reconnaissance) by the shallow waters around Japan and in the vicinity of Singapore for defence of the base. Therefore, to comply with the London Treaty quota and also satisfy the requirement for a replacement for the ageing 'H' class in the training role, a new small submarine design ('U' class) was proposed and accepted. Equipped with a minimum torpedo armament these boats were also to be able to undertake limited war-patrols and thereby partly alleviate any wartime shortage in this type of submarine.

Low Level of Naval Strength

The submarine force had constantly suffered a reduction in strength throughout the previous decade. However, many of the causes and results also applied to other warship categories. Each year the Sketch Estimates had been reduced by the Treasury as a 'temporary' measure until 'next year'.

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56. ADM 1/9728, Lawrence to Admiralty. (See Note 52.)

The result was that the Navy considered that it was gradually losing the capability to fulfil the policy expounded by the British Government.

The British Empire based its economic and military strength on secure maritime communications and even during the years of financial retrenchment the principle had always been affirmed by successive British Governments and Imperial Conferences. However, throughout this same period, four major factors had been allowed to dominate the naval requirements of the nation. Financial stringency and the 'Ten Year Rule' had done much to reduce the availability of new resources and as a result the Royal Navy had had to rely largely on utilisation of accumulated war reserves and serviceable stocks. Thus, Estimates during this period gave a false picture of the Royal Navy's true requirements. The problem was further complicated by the need, as each category of stock neared exhaustion for provision not only of new stock, but also additional material to replenish the reserves. This contributed to increased political resistance to these requests. The question of new construction had also been affected by the results of the international naval conferences which had gradually placed increasing restrictions on the different categories of warships. Political policy had also dictated further reductions above Treaty requirements as an 'earnest of good will', prior to these conferences - a gesture which other nations had not reciprocated.

Deterioration in the international situation, particularly in the Far East, as well as increasing political tension in Europe, dictated that a halt be made in the decline of the fighting ability of all three Services. To this extent the C.I.D. had recommended to the Government that the assumption governing the estimates for the defence Services, that from any given date there would be no major war for ten years, should be cancelled. The Treasury now retreated from its previous firm support for the 'Rule',

excusing the previous policy with the statement that it had not been,

> 'an essay in prophecy, but a working hypothesis intended to relieve the Chiefs of Staff from the responsibility of preparing against contingencies which the Government believe to be either remote or beyond the financial capacity of the country to provide against.' However, 'in present circumstances we are no more in a position financially and economically to engage in a major war in the Far East than we are militarily.' In the face of the enormous economic difficulties faced by the nation a, 'period of recuperation, diminished taxes, increased trade and employment was needed before the military situation could be rectified.'[57]

The Chiefs of Staff argued in return that: 'The whole of our territory in the Far East ... as well as our vast trade and shipping lies open to attack.'[58] The result was the decision by the Cabinet on 23 March 1932 to cancel the Ten Year Rule with the proviso that, 'this must not be taken to justify an expanding expenditure by the Defence Services without regard to the very serious financial and economic situation which still obtains.'[59] Increases in defence expenditure were allowed but these merely restored the 1931 level and clearly the total of naval strength, including submarines, was to remain inadequate for several years to come. The Treasury was to continue to impose financial restrictions on the Services, aided by public opinion which still saw rearmament as more likely to hasten than avert war.

Thus, the removal of the official justification for not increasing the resources in the annual Estimate still did not solve the problem that

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57. Treasury to Cabinet, 11 Mar. 1932, CAB 2/5, C.I.D. Papers 1087-B, 'Comments on Chiefs of Staff 1932 Review.'

58. Chiefs of Staff to C.I.D., 22 Feb. 1932, CAB 53/22, COS 295, 'Annual Review of Imperial Defence Policy.'

59. Cabinet to C.I.D., 22 Mar. 1932, CAB 19/32, 255 Meeting of C.I.D., 'Conclusion,' 2.

whereas the Navy Estimates for 1914 (excluding the non-effective vote) were £48,541,000, the 1932 Estimates (converted to 1914 values) represented a figure of £26,508,500. Although the Royal Navy was not faced by the German High Seas Fleet of 1914, the American and Japanese Fleets had increased by 37% and 55% respectively since 1914, while the Royal Navy had declined by 51%. Clearly there was a need for new construction, especially if, as the Admiralty concluded, 'the Disarmament Conference ... will, at the most, only achieve limited results and, further, that any future Conferences held ... will not, to any remarkable extent, ameliorate the situation.'[60]

The emergency in new ship construction was still not considered to apply to the submarine category and production was maintained at three boats per year. The major effort was to be expended on capital ships and cruisers. However, the assessment that the submarine menace to the Empire was a serious one was reiterated and plans were proposed to build up a reserve of A/S material. Failure to achieve this previously was blamed on the 'Ten Year Rule' and it was still accepted that a completely satisfactory reserve was impossible to achieve in peacetime. Nevertheless, it was considered that the experimental stage had passed and with the standardisation of Asdic equipment it was necessary to build at least a nucleus of reserve strength, to consist initially of seventeen coastal and ten ocean-convoy A/S vessels. However, the scarcity of Government resources for construction and the reduced national shipbuilding capacity, resulting from the stagnation in new construction over the previous decade, meant that no more than nine coastal and eight ocean A/S vessels were expected

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60. Field, 14 Nov. 1932, ADM 167/87, 'Review of the Present Condition of the Navy and General Remarks on Future Policy.'

to be completed by 1942. Moreover, the entire programme was scheduled to take fifteen years to complete.

Official opinion remained that A/S vessels could not be expected to provide complete A/S protection for ocean convoys since, 'owing to the very large numbers that would be needed, the role of these vessels is rather to detect and counter-attack a submarine sighted or reported in the vicinity of a convoy or after it has actually attacked the convoy.'[61] The problem of insufficient A/S escorts led to plans that merchant convoys should not exceed between sixteen and twenty vessels. However, even then calculations allowed for only two escorts per convoy instead of the four originally intended. Estimates were now for a total force of 102 ocean and 417 coastal A/S vessels (109 Europe; 308 Far East), the latter consisting largely of trawlers. However, only 30 old destroyers and fifteen sloops could be spared to be earmarked for ocean convoy work and even by 1937 it was expected that no more than seventeen would be equipped with Asdic. Coastal A/S vessels were deemed necessary, 'to escort convoys through coastal waters and in the approaches to defended ports,' and, 'to carry out offensive operations against submarines operating off ... coasts.'[62] Little or no attention appears to have been given to the possibility of air attack on coastal convoys, although the Admiralty considered the aeroplane to be a greater threat than the submarine to ocean convoys. Possibly the answer to this question lies with a belief in land-based British aircraft to nullify any threat. The only

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61. Naval Staff, 1932, ADM 167/87, T.D. 155/32, 'Formation of an Anti-Submarine Flotilla and Asdic Reserve. Part 1: Anti-Submarine Vessels Required in War.'

62. Ibid.

alleviating factor for the Admiralty, in this instance, lay in the assumption, 'that unrestricted submarine warfare will not be carried out for some time after war breaks out.'[63]

Although developments in Asdic had continued to show improvement, locating the submarine was only half the problem. The probably weakness of protection for convoys, due to insufficient number of A/S escort vessels, was not acknowledged in the preparation for exercises involving attacks on convoys. The Admiralty continued to consider the surface-raider to be the main threat to convoys and, although recognising the advantages of the convoy system in countering the submarine threat, remained convinced that this alone did not provide a complete safeguard. However, the hope was that a combination of convoy, Asdic and tonnage limitation agreements would counter any submarine menace. But any proposal to increase the size of the A/S forces in peacetime was still considered financially prohibitive by the Government. Acceptance of the inability of the Admiralty to alter the Government's decision resulted in many senior officers subconsciously accepting an exaggerated belief in the ability of Asdic to provide a complete answer to any submarine threat within limited A/S resources. Undoubtedly, advances had been made in Asdic and other A/S equipment, as well as in tactics, but whether that progress had been sufficient to guarantee a successful defence against the submarine was still far from certain. In many instances, Asdic equipped vessels could still only operate efficiently at a maximum speed of 10 knots when undertaking an Asdic sweep and only under the best weather conditions. However the lack of thought given, even during the 1930's, to the possibility of night attack by submarines on the surface

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63. ADM 1/9728, 'Submarine Building Policy.' (See Note 48.)

is more understandable given the Admiralty's continuing preoccupation with the warship as the main target for British submarines. Use of British submarines in a surface role still centred on the shadowing or reconnaissance of enemy warships and transports. This had been one of the most firmly advocated roles during the 1920's for the British submarine force and probably reflected a preoccupation with attempts to use the submarine as a substitute surface warship.

In naval policy, political factors now appeared to dictate war requirements in the relationship between Government and Admiralty. Existing and projected naval force levels were insufficient to provide even the minimum level of maritime protection in a future war. The Admiralty, however, remained initially reluctant to press for realistic strength levels for a variety of reasons. The vacuum created by Admiral Beatty's retirement and then preoccupation with the 1930 London Conference were major factors; as was the overall question of naval morale, evidenced in the Invergordon Mutiny. This in turn was a symptom of the financial forces affecting the nation. Government pressure in support of its disarmament and economic policies, with the latter reinforced by a world trading recession, remained strong. However, the deterioration of the international situation, allied to the results of the 1930 London Conference, increased concern within the Admiralty finally leading up to the promulgation of the 'New Standard of Naval Strength'. Even this represented only what the Admiralty considered to be the minimum level of naval forces needed coupled to the nation's existing shipbuilding capacity. The system between elected Government and the Services also had to be taken into consideration and many of the Admiralty's proposals, especially on the need to build up and re-equip armaments and shipbuilding firms, were anathema to a Government which like its predecessors held that the

only possible economic policy was one of deflation, and a doctrinal requirement to avoid deficit budgeting.

In the post-London Conference period, the Admiralty calculated in the submarine category that 19,000 tons had to be laid down by 1933 to reach the quota limit with a force of under-age boats. However, well into the 1930's, the effect of Treasury pressure caused an annual reduction in the resources allocated to the Royal Navy. Those categories of vessels considered less vital to naval policies were most vulnerable under this policy and the submarine was one of these. This was confirmed by the refusal to react to increases in foreign submarine fleets. Financial consideration and greater restriction of resources, rather than pure consideration of operational roles and requirements, dictated that the line of British submarine development concentrated on the patrol model. Admiralty acceptance of Government policy on finance and thereby resources ensured however that no short term improvements in submarine numbers could be expected. The decline in the number of hulls therefore continued and was officially accepted in the 1932 Geneva Conference proposals for a quantitative total of 40 submarines. Fortunately, the determination of the other major Powers to increase their naval forces was gradually to strengthen the Admiralty case on the need for a 'New Standard of Naval Strength.'

The Royal Navy continued to be regarded as essential for the security of the Empire and in the Admiralty's view this necessitated a capital fleet of sufficient strength to deter Japanese aggression. However, since the main fleet could not cover both European and Far Eastern waters there would clearly be a period before relief in the event of conflict in the Far East. The shortage of surface warships in that area ensured that the existing submarine forces would be called on to play a major role. In recognition of the growing danger permission was given by the Cabinet in June 1932 for work to recommence on the Singapore Base. There still

remained the problem, however, as to whether there would be a British Fleet available to go there. The entire Singapore strategy was dependent on such a force being available and this assumed no major naval threat in Europe. Although this assumption was plausible in the 1920's it became less so during the early 1930's. The requirement was seen as one of maintaining a favourable balance in European waters and this led the Admiralty to seek a naval agreement with Germany, one condition of which was the official acceptance of German reacquisition of submarines. Clearly, the immediate future was to be crucial, with the added prospect of the scheduled 1935 Naval Conference, and for the Submarine Service, as for the Navy as a whole, the next months would indicate either further decline or a renewal of strength.

CHAPTER 11

1934 - 1935

ANGLO-GERMAN NAVAL AGREEMENT AND PREPARATIONS FOR THE 1935 LONDON NAVAL CONFERENCE

London Naval Conference 1935-36: Preparations -

General Naval Position

The international political situation continued to deteriorate so much that the British Government were prompted to undertake an early initiative on calling another naval disarmament conference, despite the Admiralty's objections that prior clarification was needed of British naval policy. On 15 November 1933 the Cabinet had approved the C.I.D.'s list of priority areas for Imperial Defence. These included defence of Far Eastern possessions, European commitments and defence of India. Six months later the position in Europe was rivalling the Far East as a priority because of the, 'increasing evidence of Germany's intention to re-arm, with or without the consent of other Powers.'[1] Equally the position in the Far East now gave great cause for concern, and, 'pending an improvement in our relations' with Japan, 'we cannot overlook the danger created by our total inability to defend our interests in the Far East ... At the moment we are almost defenceless in the Far East.'[2] The Admiralty preferred to hold the Government's determination to participate in the 1932 League of Nations Disarmament Conference as the major reason for allowing the continued deterioration in British naval strength despite the warning from the early 1930's of the growing militarism of Japanese

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1. Naval Staff, Apr. 1934, ADM 1/8802, 'Requirements for the 1935 Naval Conference.' (Admiralty Paper No. 1.)

2. Ibid.

and German foreign policy. This solution is too simple and ignores the responsibility of the Board of Admiralty to convince the Government of the need for adequate naval defence and their failure to achieve this. The weakness in British defence capabilities were not confined to the Navy and the reasons lay in the policies of economy, disarmament and retrenchment followed since the close of the First World War. These factors were still considered by the Government to preclude the realisation of what the Admiralty considered to be a correct level of naval defence. This was defined as providing naval forces in the Far East capable of resisting any Japanese encroachment and thereby protecting British possessions, while at the same time retaining sufficient strength in European waters to deter the strongest continental naval Power. Even if such a standard had been accepted and finance made available, the reduced national shipbuilding capacity and the time needed for actual design and construction work, precluded any significant additions to the Fleet in the immediate future. Therefore the Admiralty accepted in the short-term the Government's policy of attempting to prevent an increase and preferably to achieve a reduction in the naval forces of the other major Powers.

There was however a new firmness in the position of the Admiralty; but the need to obtain substantial agreements in a second London Naval Conference had now to be considered the immediate practical need. Clearly if these were not achieved and the international situation continued to deteriorate then the major need would be to reiterate the arguments and persuade the Government, as a major priority, of the need for massive rearmament. The question then would be whether sufficient time remained to repair the neglect of a decade and a half.

In the submarine category the general policy was to propose a further reduction in national submarine tonnage to 40,000 tons, in the hope that

the other major naval Powers could be persuaded to accept parity. However, the known opposition of the French and Japanese ensured that such a move was doomed to failure from the outset. Abolition was no longer seen as a feasible policy, nor was the aim of a qualitative limit of 250 tons. The dropping of the abolition policy was defended as allowing the use of, 'the tactical and strategic advantages of submarines ... to balance to some extent, the dangers to ... trade and sea communications consequent on their retention.'[3] In addition, the Admiralty decided that it was no longer in Britain's interests to support a lowering of the qualitative limit below 2,000 tons. If an agreed quantitative tonnage limit could be strictly enforced then, 'the fewer submarines built by foreign Powers on a total tonnage the better. Numbers of small submarines are a greater danger than few larger submarines.'[4] The crucial questions remained whether any agreement could be reached and if it could be enforced. For the British the proposed limit of 40,000 tons meant that the 'G' class programme would have to be curtailed at three hulls in order to maintain the required number of submarines within the tonnage quota. It was also an opportunity to terminate what had been an extremely, 'see-saw policy in regard to the Fleet submarine since the conclusion of the war.'[5] However, in the face of the known views of the French and Japanese any reduction of overall submarine tonnage below the 52,700 tons of the London Treaty was extremely unlikely. Evidence tended to suggest that France would not agree to an overall tonnage figure below 70,000 tons and Japan was expected to insist

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3. ADM 1/8802, 'Requirements for the 1935 Naval Conference.' (See Note 1.)

4. ADM 1/8802, 'Requirements for the 1935 Naval Conference.' (See Note 1.)

5. Little to Third Sea Lord, Rear-Admiral Sir Charles M. Forbes, 27 Feb. 1934, ADM 1/9373, M.F.0.2506/34.

on at least a similar figure.[6] Any agreement on these lines would then lead to the United States demanding parity with Japan, and Italy parity with France. The resulting increase in world submarine tonnage would obviously be to Britain's disadvantage. Britain certainly had a requirement for 70,000 tons but the abvious disadvantage lay in encouraging the other major Powers to claim similar and larger quotas. Despite the improved performance of Asdic the consequence of German re-acquisition of the submarine could not be ignored. This raised again the thorny question of the provision of A/S escort vessels in sufficient numbers. The Admiralty considered that:

> 'If, as seems certain, submarine tonnage cannot be ... reduced, fuller measures of protection against submarine attack must be prepared. The existence of large submarine forces of any foreign Power capable of expansion in war, with its potential threat to our trade, cannot be ignored ... Great additions to our destroyer and anti-submarine forces might be required to deal with this menace.'[7]

However, there was a shortfall in providing convoy escorts and this weakness was considered to make the grouping of merchant ships in convoys a danger rather than a security. The Admiralty's view now was that the shortage was a result of excessive arms limitation policies by successive Governments. In applying this argument to cruisers, where the strength of the force had been allowed to fall to 50, the Admiralty were on stronger ground than over destroyers and other A/S escorts. Nevertheless, in both cases requirements had been pared back to inadequate levels by a lack of determined resistance by the Admiralty. Throughout this period the Admiralty had given tacit approval to the debilitating policies of

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6. Naval Ministerial Committee of the Cabinet, 28 May 1934, ADM 116/3373, P.D. 04526/34, 3rd Meeting.

7. First Sea Lord, Admiral Chatfield, Apr. 1934, ADM 116/2999, 'Preparation for the 1935 Naval Conference.'

disarmament by restricting opposition to the level of internal statements of disapproval. Thus in 1930 agreement was given to a surface cruiser force of only 50 vessels, a total which had been rejected in 1927 and which had led to the threat of resignation by the Board of Admiralty. However, in mitigation it must be emphasised that in 1927 in the person of Admiral Beatty the Navy possessed someone whose resignation from office would have commanded public attention and led to domestic questioning of Government policy. In 1930 the Board believed and accepted that resignation would not have affected public and Parliamentary acceptance of Government disarmament policy. In general terms this lack of prestige and the 1929 financial recession contributed to acceptance of Government policies; and this submission was reinforced by the nation's apparent tacit support for these policies. However, when by the period after 1933 the international situation began seriously to deteriorate and the Admiralty felt it could be sure of some political and public support for its demands for re-armament, then not only were Government policies objected to but counter proposals also put forward with a degree of confidence.

Irrespective of military or political requirements, therefore, there was a limit to the measures which could be taken quickly to rectify any shortage of matériel. Thus, while it was calculated that Britain possessed a military requirement for a submarine force of 70,000 tons, the political, economic and construction factors dictated that proposals for a national tonnage quota of only 40,000 tons be retained for the 1935 Conference. However, there was little enthusiasm for a policy of parity, at this figure, for all the major Powers, as this was considered 'likely to produce complication in practice.'[8] Nevertheless, some effort was

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8. Foreign Office to Admiralty, 1934, ADM 1/8802.

considered necessary, to seek agreements curtailing the expansion of foreign submarine fleets. Whatever the outcome it was clear that in the post-Conference period an extensive reappraisal of both submarine and A/S requirements, for naval defence of the Empire, would be required. During 1934 the Admiralty had calculated that a minimum of 200,000 tons of destroyers and other A/S escort vessels would be required on the outbreak of war. It was correctly realised that the size of the A/S force was not primarily decided by the potential numbers of enemy submarines but rather on the number and size of convoys to be protected. Nevertheless, the proposed overall tonnage provided for only approximately 100 vessels which would be required for both fleet protection and convoy escort. Calculations indicated that this would result in a force of only, 'two A/S vessels to each convoy. In September, 1918, on a basis of five A/S vessels to each convoy we were thus employing some 300 vessels.'[9] Clearly, even with the improvements made to Asdic equipment and A/S weapons since 1918, this was a weak level of protection which could be overwhelmed if several submarines were to attack together.

Meanwhile, as part of the preparations for the 1935 Naval Conference, definite submarine tonnage limitation proposals had been submitted by the major naval Powers. The United States had no firm views on quantitative tonnage but they were happy to continue with the existing qualitative limit of 2,000 tons. Although the French were also agreeable to such a limit, the problem of agreement on a quantitative tonnage was not to prove so simple. France was prepared to reduce her submarine force to 80,000 tons but only if the other submarine fleets were stabilised at their existing levels. A further offer to, 'contemplate further reductions below this level by scrapping submarines as they become over-age and only building

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9. ADM 1/8802, 'Requirements for the 1935 Naval Conference.' (See Note 1.)

'sufficient new ones occasionally to keep the dockyards efficient in this type of construction,'[10] was dependent on tonnage compensation in other categories, noteably capital ships. This was unlikely to prove acceptable to the British who could afford no further deterioration in the naval ratio vis-a-vis the other major Powers.

The Italians accepted the London Treaty figure of 52,700 tons and proposed a qualitative limit of 1,400 tons. However, the French were not prepared to accept a low quantitative figure, while the Japanese regarded the submarine category as capable of being merged with the 6 inch gun cruisers and the destroyers, over which there was to be no tonnage limit. Failing agreement on this, they were prepared to settle for a single category for submarines but with a quantitative limit of 120,000 tons.[11] The British reply, simple and clear, was that such a figure was unacceptable. Moreover, the Admiralty concluded that:

> 'It now seems more than probably, that we shall fail to induce the Japanese to recede from their main demand i.e., the right to equality, the right which if it were granted to Japan, would also have to be granted to the European Signatories of the Washington Treaty and which would inevitably be extended to Russia and Germany.'[12]

If their demands were not granted the Japanese threatened to denounce the Washington Treaty and proceed to build submarines without restriction. The Naval Staff considered that the possession of such a force would have little effect on the European Powers and this contrasted oddly with earlier

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10. Foreign Office, 3 Oct. 1934, Documents on British Foreign Policy, (London, 1973), 2 ser., XIII, 48, 'Results of Preliminary Conversations Relating to Preparations for the 1935 Naval Conference Held with the United States, Japanese, French and Italian representatives.'

11. Foreign Office to Cabinet, 27 Oct. 1934, D.B.F.P., 2 ser., XIII, 73, 'Report on the Preliminary Naval Discussions with Japanese Representatives.' N.C.M. (32) 22.

12. Chatfield, 30 Oct. 1934, D.B.F.P., 2 ser., XIII, 77-78, N.C.M. (35) 23.

opinions denouncing a parity figure of 70,000 tons. The reasoning now seemed to be that the Far East was a different theatre of operations, so that although in Europe the Admiralty seemed mesmerised by the proximity of France to British trade routes, in the Pacific safety was seen to lie in the remoteness of Japan from the main British trade routes. A Japanese submarine force as a threat to merchant shipping, 'would be a serious inconvenience but in view of modern methods of dealing with submarine ... they would not be more than that.'[13] This also seems at odds with earlier Admiralty assessments, particularly on the shortage of A/S escorts and Asdic equipment for an Eastern war. It also indicates an illusory belief in the efficiency of Asdic. During December 1934 the Admiralty was partially successful in persuading the Japanese to modify their submarine demands to below 100,000 tons.[14] How far below this figure the reduction would be made was not clear but indications were that it was far above the French claim for 80,000 tons. There is some evidence that the Admiralty was considering a parity figure meeting French requirements in the hope of ensuring the success of British proposals in other categories which would result in a new long-term naval arms limitation treaty. Together with the Japanese proposals this idea was greeted with some astonishment. 'The Japanese submarine proposition seems utterly fantastic. How comes it that ... The Admiralty can even contemplate 80,000 tons.'[15] Meanwhile, the desire to believe in the efficiency of A/S methods appeared to Government observers to have spread widely within senior naval circles.

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13. Ibid.

14. Little, 6 Dec. 1934, D.B.F.P., 2 ser., XIII, 148, 'Record of a Conversation with Vice-Admiral Yamamoto.' (N.C.(J) 7th Meeting.)

15. Sir R. Vansittart, Dec. 1934, D.B.F.P., 2 ser., XIII, 149, 'Footnote No. 3 to Document No. 88'. (See Note 14.)

'Admiralty I believe consider submarines less of a danger than formerly, at any rate as regards battlefleets, owing to the development of protective measures in recent years.'[16]

Further meetings with the Japanese did not result in any reduction of submarine tonnage demands. The Admiralty concluded that: 'His Majesty's Government could not possibly consider figures such as those that had been indicated by Admiral Yamamoto.'[17] Stalemate then ensued while the Japanese representatives returned to Japan for further instructions. Meanwhile, the size of the existing Japanese submarine force was exercising an influence on British construction plans. Even in the remote event that the initial British proposal of 40,000 tons had been accepted it would still have taken a long time to bring Japan down to this figure because of the large amount of relatively new tonnage she possessed. Recognition that the Japanese would never reduce to 40,000 tons clearly emphasised that it was, 'undesirable for us to omit provision for replacing our over-age vessels, if we are to maintain our position vis-a-vis foreign powers during the period of reduction. It is therefore necessary to include some submarines in the 1935 Programme.'[18] However, Admiral Chatfield had, accurately, explained that it was erroneous to base British submarine requirements on the strength of foreign submarine fleets. Therefore, it would have made more sense to counter such an increase (and its implicit threat to merchant shipping) by including more A/S escorts in the construction programmes.

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16. Ibid, Lord Stanhope (Parliamentary Under-Secretary of State for Foreign Affairs).

17. Chatfield, 28 Dec. 1934, D.B.F.P., 2 ser., XIII, 157, 'Record of a Meeting between United Kingdom Representatives and Admiral Yamamoto.' (N.C.(J) 10th Meeting.)

18. Chatfield, 12 Oct. 1934, ADM 167/91, '1935 Naval Construction Programme.'

Use of British Submarine Forces in the Far East

On 30 December 1934 the Japanese Government officially denounced the Washington Naval Treaty and brought into prominence an earlier Admiralty memorandum which had been intended, 'to draw attention to the important role which submarines will be called upon to play in "holding the fort" in the Far East ... and the inadequacy of the existing provisions in that respect.'[19] The recommendation then had been that the submarine strength on the China Station should be increased from fifteen to 21 boats. The withdrawal of the Japanese from any naval arms limitation agreement, allied to a deteriorating political situation in the Far East, indicated an immediate need for increases in the submarine force in the Pacific. The role of these boats was defined as: 'The security of the Singapore Base and its facilities,'[20] until relief arrived with the main Fleet. Submarines were to be employed in Japanese waters as advance warning of any invasion fleet destined for Singapore. However, evidence suggested that: 'The number of submarines available ... would not suffice for keeping an efficient watch on all the possible points of departure.'[21] Nevertheless, the Government were not prepared to jeopardise their efforts to achieve agreement on reduction of quantitative submarine tonnage by increasing British requirements. Therefore any increase in the number of boats on the China Station was unlikely in the immediate future. Existing submarine strength was so low that in the event of war, doubt existed as to whether boats could be spared from Home Waters. Provision of such reinforcements depended on reaching agreement with France and Italy at the 1935 Conference.

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19. D. of P., 12 Feb. 1934, ADM 116/3862, M.O. 0570/35, 'Disposition of Naval Forces in Phase 1 - War in the Far East.'

20. D. of P., 1934, ADM 116/3862, 'Eastern War - Appreciation of the Situation of the Eastern Forces During the Period before Relief.'

21. Ibid.

On operational roles, the value of submarines in reconnaissance patrols off Japan was calculated as small, despite the fact that this contradicted one of the requirements influencing the design of the new medium patrol submarines.[22] In addition, the presence of British submarines off Singapore, rather than having to operate in Japanese waters, was considered sufficient to persuade the Japanese to invest expensively in A/S forces. The proposal was that:

> 'The principal value of submarines in connection with the security of Singapore during the period before relief is considered to lie in the fact that, by virtue of their ability to operate unsupported against superior forces, they, alone among naval forces, are capable of offering direct opposition to a Japanese attack in force at any time. It is further considered that the most efficient way of using them in this role would be by concentrating them in the vicinity of Singapore.'[23]

This was a reiteration of the roles proposed during the early and middle twenties when memories of the ineffectiveness of submarines in the coast and port defence role were even clearer. The report appeared as more of a means of justifying the fact that the number of submarines in the Far East was so limited rather than as an accurate assessment of operational requirements. Although during the Second World War the United States submarine force was to sink 63% of Japanese merchant tonnage, the range of British submarines in 1934 indicated that for a sustained anti-commerce campaign they would have to operate from Hong Kong. This disposition was precluded as the base was considered vulnerable to any Japanese advance. Moreover, under the Four-Power Agreement signed at Washington in 1922 the military installations at Hong Kong could not be improved in order to reduce the vulnerability of the base.

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22. D.N.C. to Board, 30 July 1935, ADM 167/92, 'Sketch Design for "T" Class Patrol Submarine.'

23. ADM 116/3862, 'Eastern War'. (See Note 20.)

Anglo-German Naval Agreement - Background and Initial Moves

The Admiralty, however, was now more concerned to turn its attention to solving the problem of German naval rearmament before becoming embroiled in the complexities of a full naval conference. The validity or otherwise of Far Eastern submarine policy was relegated to one side pending the solution of these other issues. Under the terms of the Treaty of Versailles, Germany was forbidden to build submarines but information reaching Britain indicated that plans were underway to increase the size of the German naval forces, as part of an overall policy of rearmament, and that submarines would be included. During June 1934 the Admiralty concluded that if Germany were to be included in any future naval arms limitation agreement, as a means of curbing her rearmament, then:

> 'Under equality of treatment, Germany could not be denied submarines if they are retained by other Powers, and it has been the Admiralty policy for some years that she should be permitted a small tonnage in this category. It is proposed that she should have 5,000 tons.'[24]

However, this was to be dependent on German agreement to a naval arms limitation treaty and not as a separate pact. In December 1934, an Admiralty assessment of German submarine construction capability concluded that Germany could build four boats annually after 1935 rising to possibly six per year by 1940. Total German submarine forces were not expected to exceed twelve boats by 1939 and 30 by 1942.[25] This was at a time when Admiral Doenitz estimated future German requirements as being, 'at least 300 operational U-boats in order successfully to wage war against shipping.'[26]

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24. Plans Division, 29 June 1934, ADM 116/3373, 'Limitation of German Naval Armaments.'

25. D. of P., 5 Dec. 1934, ADM 116/3373, 'Minutes of 63rd Meeting of the Joint Planning Sub-Committee.' (Endorsed by D.N.I. - 17 Dec. 1934.)

26. K. Doenitz, Ten Years and Twenty Days, (London, 1959), 33.

Preparations were already underway to manufacture prefabricated parts for 250 tons coastal submarines at various shipyards to await the decision to begin construction. The only question was whether this decision would be the subject of an international agreement or a unilateral declaration by Germany. According to Doenitz, Hitler's object at this time was to attempt to persuade Britain to disassociate herself from the opposition he expected from the other Powers to Germany's renunciation of the military clauses of the Versailles Treaty. By concluding a naval agreement with Britain: 'He hoped thus to put an end also to British political hostility in the future, for a limitation of naval armament thus voluntarily accepted would be clear proof that Germany had no intention of attacking Britain.'[27] Hitler's hopes could only have been raised when the British failed during 1934 in attempts to form a united policy with France and Italy on German naval rearmament. In the Admiralty's view the question was not whether Germany should be allowed to rearm but rather, 'what size of German Navy, quantitative and qualitative they were prepared to let the Germans attain in order to secure a general settlement.'[28] However, any agreement had to be connected to existing or proposed naval treaties. An understanding with France and Italy would have been an added advantage. Therefore, Admiralty proposals were to allow Germany at most to, 'have a navy equal to that of the strongest power in the Baltic,'[29] including 5,000 tons of submarines. During February 1935 agreement was reached that any settlement with Germany on armaments should replace the provisions of Part V of the Treaty of Versailles.

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27. Doenitz, op. cit., 9.

28. D. of P., 16 Jan. 1935, ADM 116/3373, 'German Naval Armament.'

29. Ibid.

British hopes were that Germany could be included in the forthcoming Naval Conference and to this end a meeting was arranged with the Germans for an informal exchange of views. In accepting this invitation the German Government clarified their request for a total tonnage equal to 35% of the Royal Navy. Initial British reaction was that, 'such a figure, if persisted in would render qualitative limitation definitely impossible so far as the European Powers are concerned.'[30] The hope was that after further discussions the Germans might 'prove more reasonable'. However, clearly if these talks and the parallel conversations with the French and Italians failed then the 1935 Naval Conference would have to be postponed, rather than risk as abortive meeting. This step was, 'clearly undesirable except as a last resort, since its psychological effect must necessarily be bad,' further, 'it would leave the door open to uncontrolled rearmament by Germany and to competitive building between France and Italy.'[31] These major fears by both the Government and Admiralty made an agreement of even 35% of British naval tonnage, attractive. An added incentive was provided by Hitler's announcements during March of Germany's resumption of full sovereign rights and the implementation of compulsory national service for the Army and of the 'official' existence of the German Air Force. These were flagrant breaches of the Versailles Treaty, which the other major Powers had made no physical moves to oppose. British requests for information on proposed submarine construction led to the German admission that orders had been given for only twelve boats of 250 tons each.[32] Although

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30. Foreign Office & Admiralty, 30 Mar. 1935, D.B.F.P., 2 ser., XIII, 181-87, 'Questions of Naval Limitation.'

31. Ibid.

32. Sir E. Phipps (Berlin) to Sir J. Simon (Foreign Secretary), 25 Apr. 1935, D.B.F.P., 2 ser., XIII, 198.
See also: Documents Nos. 150, 165, 188, 271.

the subject of much comment in the British press and Parliament, the incident was not regarded as serious although it did engender an air of mistrust. However, the issue whether or not Germany already had any submarine sections ready for assembly was considered less important than the need to reach an international agreement on naval arms limitation.

Hitler finally denounced Part V of the Treaty of Versailles on 12 May 1935 and further announced that the German Navy would be restricted to 35% of the Royal Navy's tonnage and 15% below the French total. On submarines, he proclaimed German support for abolition, provided all the other naval Powers supported such a policy, knowing that this was unlikely. The repudiation of the Versailles Treaty did not result in a belligerent reaction from the British Government but rather in the naval sector, in an extension of its disarmament policies. The Admiralty made a thorough re-assessment of the probable effects if Germany was allowed to construct up to 35% of British naval tonnage.[33] The conclusion remained unchanged from the earlier appreciation by the Naval Staff of British requirements for the 1935 Naval Conference[34] and the views expressed in the Chiefs of Staff's Annual Review for 1935. These held that it was essential to be able to provide sufficient naval strength in the Far East to prevent Japanese aggression while ensuring adequate strength in European waters to deter the strongest naval Power. A Two-Power Standard was precluded and this was presented as meaning that the Admiralty could not guarantee the security of sea communications. Moreover the despatch of a sufficiently strong fleet to the Far East would clearly leave Britain in an inferior naval position in Europe. If the Government would or could not supply

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33. Plans Division, 27 May 1935, ADM 116/3373, 'Notes on German Naval Strength: Strategic Implications of the 35% Ratio.'

34. Naval Staff, Apr. 1934, ADM 1/8802, Admiralty Paper No. 1, 'Requirements for the 1935 Naval Conference.'

the resources to rectify these matériel weaknesses it had to accept that Britain could not, 'simultaneously fight Japan and the strongest European naval power.'[35] The Chiefs of Staff provided endorsement for this conclusion.

> 'The existing margin is only sufficient on the supposition that France will not be our enemy in Europe and that we are not without allies.' Further: 'That we should be called upon to fight Germany and Japan simultaneously without allies is a state of affairs to the prevention of which our diplomacy would naturally be directed.'[36]

The proposal was that France should be maintained as a friend and ally which would allow the main Fleet to be sent to the Far East if needed. The minimum level of strength the Admiralty proposed to accept in Home waters, if a Fleet was sent to the Far East, comprised a surface force equal to that proposed for Germany. This tended to emphasise the feeling that an agreement should be reached with the Germans even on a 35% limit.

The alternative was unrestricted German naval rearmament and the added strain this would impose on Imperial defence. Overall, Britain had to, 'in the next three or four years, be able to provide naval security in an alliance with France against Germany, while at the same time defending ourselves against Japanese aggression.'[37] Existing Japanese and German naval tonnage was 64% and 11% of the British total respectively. Even allowing Germany a strength of 35% was considered to leave a sufficient margin to meet the requirements of both European and Far East naval defence, with the proviso that Japanese naval strength remained at the 1935 level.

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35. ADM 116/3373, 'Notes of German Naval Strength.' (See Note 33.)

36. ADM 116/3373, 'Notes on German Naval Strength.' (See Note 33.)

37. ADM 116/3373, 'Notes on German Naval Strength.' (See Note 33.)

This was unlikely since Japan favoured equality with Britain and the United States. No doubt the Admiralty had hopes of a reduction in the Japanese proposals but this does not clarify the recommendation that, 'an ultimate 35% ratio for Germany is strategically acceptable, provided we maintain our present ratio vis-a-vis Japan.'[38] This was especially true when existing evidence indicated that the ratio could only be maintained by increased British naval construction, which the Government was loath to accept.

Anglo-German Naval Agreement - Negotiations and Signing

On 2 June 1935 the German delegation, headed by the Foreign Minister Ribbentrop, arrived in London for the first meeting with British naval representatives. The Germans were quick to press for, 'a clear and formal recognition of the decision taken by the German Government laying down a relationship between the British and German fleets in the proportion of 100% to 35%.'[39] This was given as the basis of political and naval advice, in which the latter held that:

> 'The statements of Herr Hitler, as amplified by the German representatives in the current conversations, make it clear that there is no prospect whatever of Germany coming to an agreement on any question including the extremely important one of qualitative limitation, except on the thirty five per cent basis.'[40]

Whether this achievement was another case of successful political bluff by Hitler or not was rendered less important by Admiralty thinking on the need for such an agreement. 'Since our strategical requirements must take

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38. ADM 116/3373, 'Notes on German Naval Strength.' (See Note 33.)

39. British Representatives, 5 June 1935, D.B.F.P., 2 ser., XIII, 364, 'Anglo-German Naval Discussions.' (N.C.M. (35) 50.)

40. Naval Staff, 5 June 1935, D.B.F.P., 2 ser., XIII, 369, 'Memorandum on the German Proposal for a 35% Naval Ratio.'

'account of both Germany and Japan it is evidently to our advantage that the naval forces of each or either of them should (a) Be Limited (b) Be limited at as low a figure as it is possible to secure.'[41] This solved the immediate necessity of seeking additional construction resources from a reluctant Government. Statements by the German delegation that their Government would, if no agreement was forthcoming, build past the 35% level irrespective of the views of France and the other major Powers, appeared to reinforce the belief that this was the only opportunity to place a restriction on renewed German naval building. A generally favourable attitude was also forthcoming from both Government and Admiralty because the Germans, unlike the Japanese, were asking for only 35% and not parity. However, the one area where Germany wanted to press for parity was submarines.

The Naval Staff concluded that failing an international agreement on abolition, Germany would eventually acquire a right to build submarines. The Germans had already made it clear that if the other naval Powers achieved parity with Britain, in the submarine category, under any future agreement, then Germany would expect similar rights. However, this was not to be taken to mean that they would build up to this level but with sections for twelve submarines, at least, already available, then clearly Germany was unlikely to maintain a low submarine strength. Admiralty calculations were that a force of 50-60 boats could result if Germany were allowed parity. Despite these figures, faith in the efficiency of Asdic was such that the attitude adopted to so potentially dangerous a situation was only that it 'must arouse some misgiving.'[42] Attitudes continued to be based on the belief that attempts to prevent German naval rearmament would result in unilateral action by Germany, whereas attempts

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41. Ibid.

42. D.B.F.P., 2 ser., XIII, 369. (See Note 40.)

to reach a moderating agreement might be successful. Thus, despite the evidence of extensive preparations for submarine construction it was still accepted, with some conviction, that the Germans did not have any 'desire to acquire a large Submarine fleet.'[43]

German proposals for an increase in submarine tonnage from 35% to parity were answered only by the qualification that the increase should be drawn from other categories and therefore, 'that the additional submarine tonnage would have to be reckoned as part of the total tonnage.'[44] This view by a former Head of the Submarine Service is symptomatic of the casual approach to the issue of German re-acquisition of the submarine. Although developments in Asdic were continuing, only a couple of years had passed since Admiral Field had proclaimed that even with Asdic equipped escorts a convoy could not be considered as completely safe from the submarine. Further, naval officers holding senior rank were only too aware, from personal experience, how serious were the effects of an intensive submarine campaign.

Meanwhile, on 17 June the German representatives had presented proposals that included an overall tonnage limit for their Navy not exceeding 35% of the British. Within this total Germany was to be allowed eventual parity on submarine tonnage, but in the immediate future however the Germans were satisfied with a limit of 45%.[45] Over the long term, it was stressed, parity would be desirable to meet Germany's requirements in coast defence in the Baltic, especially vis-a-vis the Soviet Union. In the interests of

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43. D.B.F.P., 2 ser., XIII, 369. (See Note 40.)

44. Admiral Little, 6 June 1935, D.B.F.P., 2 ser., XIII, 378, 'Notes of the 4th Meeting Between Representatives of the United Kingdom and Germany.'

45. British Representatives, 15 June 1935, D.B.F.P., 2 ser., XIII, 417, 'Draft Agreement Discussed at 6th Meeting of United Kingdom and German Representatives.'

securing an overall agreement the British were prepared to concede the principle of parity, especially as they did not regard the role of the submarine as primarily A/S. The result was that German submarine building was not considered as likely to necessitate an automatic increase in the British force. Therefore, on 18 June the British Government formally accepted the German right to parity in the submarine category, although initially the German Navy was to be limited to 45%. Significantly the only real controls were in the hands of the Germans. They could decide when to increase their submarine force to the level of parity, while the British were restricted to merely, 'a friendly discussion,'[46] before Germany exercised her right to increase construction. There were no objections from the Germans as the Anglo-German Naval Agreement was signed the same day with the 45% allowance equalling 24,000 tons. The German decision to build small submarines was mainly dictated by the limited tonnage available to them even if they invoked the 'escape' clause allowing parity. The result by September 1939 was a force of 58 U-boats; one more than the Royal Navy had but still well below the 200-300 boat force that Doenitz considered necessary for an effective submarine campaign against Britain.

Anglo-German Naval Agreement - Reasons

On the importance of the Agreement to Germany, Doenitz held that: 'Britain's acquiescence in the possession by Germany of 45% and in certain given circumstances of 100% of British submarine tonnage instead of the 35% laid down for the other categories did not ... amount to anything very much in the way of concession.'[47] Among several reasons he proposed for Britain's acceptance of the German re-acquisition of the submarine was the assessment of the secondary role this weapon was accorded by British naval

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46. Simon to Herr Von Ribbentrop, 18 June 1935, D.B.F.P., 2 ser., XIII, 431.

47. Doenitz, op. cit., 11.

planners. Britain's dependence on seaborne imports of raw materials and the need to defend the large merchant fleet this necessitated was recognised as well as the vulnerability of the lengthy Imperial sea communications.

> 'Such protection, however, can only be provided by surface vessels and not by submarines ... Then again, as Britain had no potential adversary upon whose sea lines of communication she would in war be compelled to launch large scale submarine attacks, she obviously did not feel the need of a strong submarine arm.'[48]

Nevertheless, these statements were erroneous as an assessment of the Admiralty's reasons for allowing German re-acquisition of the submarine which were based on the importance attached to voluntary restriction of German naval rearmament and an exaggerated belief in the power of Asdic to counter the Submarine. In addition, the Germans had agreed to abide by Part IV of the London Naval Treaty, governing the actions of submarines against merchant ships,[49] and: 'The U-boat is vulnerable when surfaced - when exposed for example, to gunfire.'[50]

Meanwhile, the British Government came under pressure not only domestically but also from the French, who were incensed over what they considered to be unilateral action on the part of the British. Primarily, the French were concerned about the abrogation of the naval clauses of the Versailles Treaty as well as the technical aspects of the Agreement, including the provisions on submarine construction.[51] The British Government's eagerness to reach an agreement with Germany on naval arms limitation

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48. Doenitz, op. cit., 10.

49. Admiralty, June 1935, ADM 116/3377, 'Anglo-German Naval Conversations, 1935: Summary of Discussions Between the British and German Naval Representatives.'

50. Doenitz, op. cit., 10.

51. Sir G. Clarke (Paris) to Sir S. Hoare (Foreign Secretary), 19 June 1935, D.B.F.P., 2 ser., XIII, 437.

was evident in the answers to the French charges.

> 'We had always been nervous of letting the Germans go back to Berlin, because we had good grounds for believing that Herr Hitler had overruled the German Naval Staff,' who had objected to the 35% limit, 'and we feared that, if the delegation returned, they would come back to London with fresh demands.'[52]

The British went to great lengths to minimise the importance of the parity concession. The reasons given included such differing admissions as that it was a concession the British did not want to make but which did not greatly alter the situation; that if Britain retained her existing submarine strength, the Germans would be unlikely to want to go up to the 45% limit; and finally that if a future naval treaty awarded parity to all the major naval Powers then Germany's claim to equal treatment would also have entitled her to parity. This ignored German repudiation of the Versailles Treaty and the fact that the Anglo-German Naval Agreement amounted to official British approval of this act. Whether the French considered these explanations to be satisfactory or not, relations between London and Paris deteriorated for several months. Certainly, the French had shown little inclination to engage in discussions with the Germans or advance alternative methods of dealing with the obvious spectre of German rearmament. A combined approach would possibly have led to a different agreement including land armaments. However, Hitler's acceptance of an inferior position for the German Navy could have been determined by the greater priority accorded to the Army and Air Force. Thus, without affecting overall planning he had been able to placate British naval fears and divide two allies at the same time.

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52. Sir R. Craigie (Under-Secretary of State at the Foreign Office) to Clarke, 1 July 1935, D.B.F.P., 2 ser., XIII, 497.

The reasons of the British Government for seeking the Agreement had been stated at Geneva in 1932 and remained largely unchanged. On the specific issue of submarines, the central factor was the Admiralty's belief that counter-measures had been developed to nullify the submarine threat to British shipping. This point was emphasised in discussions with the United States Naval Staff. 'The Admiralty is not so seriously apprehensive of submarines as they believe that they can successfully deal with them.'[53] Further, it was erroneously calculated that resources allowed to submarine construction would not enable the German Navy to pass their agreed quota until 1942. In 1939 the Germans were still within the limits but this was largely due to the priority given to the Army and Air Force. Information forwarded by the Germans in 1935 had showed plans for a force of 80 submarines to be built by 1939.[54] This meant that within four years the Royal Navy might expect to have to counter a submarine force twice the size that pre-Agreement predictions had indicated.

However, both the Government and Admiralty viewed the negotiations with Germany as part of the general preparations for the 1935 London Naval Conference. The hope was that a new long-term treaty on naval arms limitation would emerge to replace the Washington and London naval treaties. The Government considered it essential to hold a Conference during 1935 as the existing treaties expired during 1936. The Admiralty also needed to know the limits on warship displacement and gun calibres by the end of 1935. Otherwise it would be, 'impossible to make the necessary technical preparations in time or to frame the financial estimates with any degree

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53. L. Pratt, 'Anglo-American Conversations on the Far East,' International Affairs, XLVII, (1971), 760-63.

54. D.N.I., 16 Nov. 1935, ADM 116/3368, 'Official Particulars of German Submarines.'

'of accuracy.'[55] The signing of the Anglo-German Naval Agreement was seen as adding Germany to the understanding with the United States as a basis for future naval relationships. However, the French refused to send a delegation to London to continue the preparatory discussions on the 1935 Conference. Italy was expected to follow France's lead and the Japanese position appeared unaltered from December 1934. The British were careful not to provoke a complete French withdrawal and thought it wiser not to include Germany in the Conference, which would be restricted to the Washington Powers, although Russia and Germany would be considered for a later Conference.[56] Messages to this effect were filtered through to the French via the Americans.

On 29 July the French Ambassador forwarded the suggestion that, 'a delegate from the Admiralty should go to Paris shortly in order to break the ice which has formed since the Anglo-German Naval Agreement and to set in motion preliminary discussions on naval limitations.'[57] In agreeing, the British emphasised that these conversations were not to be replacements for the existing series of preliminary discussions on the Naval Conference. During the Anglo-French talks, held in Paris on 6 and 7 August,[58] the French emphasised their continued opposition to abolition but agreed with the British proposal for a qualitative limit of 2,000 tons.[59] A certain amount of alarm was created by the French demand for an

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55. Foreign Office & Admiralty, 18 July 1935, D.B.F.P., 2 ser., XIII, 526, 'Memorandum on the Future Course of Naval Negotiations.'

56. Hoare to Sir R. Lindsay (Washington), 29 July 1935, D.B.F.P., 2 ser., XIII, 565-66.

57. Vansittart to Chatfield, 29 July 1935, D.B.F.P., 2 ser., XIII, 566-67.

58. Captain Danckwerts, Aug. 1935, D.B.F.P., 2 ser., XIII, 589-94, 'Record of Anglo-French Naval Discussions.'

59. Hoare to Clarke, 7 Aug. 1935, D.B.F.P., 2 ser., XIII, 588.

escalator clause to counter any rapid increases in the German submarine force. However, British fears of another round of tonnage increases were calmed by French assurances that any additional construction would not be claimed in the submarine category. Finally, the French agreed to accept Part IV of the London Naval Treaty provided that this was treated not as a naval matter but rather one for international law and therefore would be excluded from any agreement on naval arms limitation.

On submarine construction the Admiralty remained satisfied to be bound by the provisions of the London Naval Treaty. Approximately 10,500 tons were available for the 1934-36 programmes and only 6,000 tons had been allocated to the 1934 and 1935 programmes which left a larger amount of tonnage than had been previously assigned to an annual programme. Proposals for the 1935 Naval Conference now set the total force at 47 boats comprised of six minelayers, three 'G', twenty 'T', twelve 'S', and six 'U' class. Provision had been made for the majority in existing programmes and the most urgent need was to further the construction of the 'U' class since the 'H' class boats could not be retained in a safe and seaworthy condition for much longer. However, submarines continued to be allocated a low priority in construction. 'This programme is based on (1) maintaining the Fleet at approximately the same strength as has been aimed at in recent years, (II) commencing as rapid replacement of the Battlefleet as is practicable.'[60] Clearly no extra resources were considered necessary or would be available for additional submarine construction and the 4,000 tons available for 1936 under the London Naval Treaty were considered sufficient. However, the Admiralty decided to include one 'T' class[61]

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60. Chatfield to Board, 16 Nov. 1935, ADM 1/9037, '1936 Naval Construction Programme.'

61. Board Minute No. 3315, 28 Nov. 1935, ADM 1/9037, '1936 New Construction Programme.'

since, 'this class will be the standard patrol submarine for some years to come, and the technical departments feel confident that the construction of the "T" type can safely be continued without waiting for experience of the first vessel.'[62]

Meanwhile, the Government were sufficiently satisfied with the results of the discussions with the major naval Powers to issue invitations for the Naval Conference, scheduled to open during early December 1935. The Naval Ministerial Committee met on Trafalgar Day and recommended to the Cabinet that in the final proposals, quantitative submarine limitation should be downgraded and emphasis placed on securing agreement on qualitative limitations.

The Admiralty was privately relieved over the rejection of any abolition proposals since growing Japanese military power and belligerency, allied to the potential threat from a rearmed Germany aroused concern over the Navy's deficiencies in quantity and age of material and the need to rectify this in the face of continued Government opposition. Moreover, despite improvements to Asdic, the possibility of possible German re-acquisition of the submarine could not be entirely ignored. Yet at this moment the Admiralty had chosen to support the conclusion of naval agreement with Germany under which the latter were allowed to build up to 45% of British submarine tonnage and then to 100% with no real British control over the escalation. This may appear to have been a strange decision to make at a time when it was being stated that the convoy system, even supported by A/S escort forces was no guarantee of safety against the submarine. However, the Admiralty considered that there was a greater need for an overall naval agreement with Germany. The recommendation was

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62. Monsell, Jan. 1936, ADM 116/3394, '1936 New Construction Programme: Section E - Submarines.'

that Germany be brought into an international agreement which would allow the Germans the right to build large surface warships and free them from the prohibition on submarine construction: it involved the gamble that Germany would continue to adhere to and not contravene such an agreement. Recognising that the inevitable increase in pressure from the Germans for release from the disarmament clauses of the Versailles Treaty might lead to unilateral action, especially if the other Powers adopted a negative view, the best solution had been considered to be to persuade the Germans to an agreement with limitations on tonnage rather than risk no agreement at all. The alternative was the possible collapse of the Washington and London Naval Treaties, under the pressure of a naval building race. Such a development would have spelt the failure of a decade of continuous activity on disarmament by successive British Governments.

CHAPTER 12

1935 - 1939

1935 LONDON NAVAL CONFERENCE AND RE-ARMAMENT

In many ways, the second London Naval Conference, which opened on 9 December 1935, was a disappointment. Despite months of tortuous negotiations the net result was an increase in the overall tonnage demands of all the invited Powers. Proposals for abolition or tonnage restriction in the submarine category proved abortive.[1] The British allied their submarine proposals with destroyer and other A/S tonnage demands. In contrast to the 1930 London Conference an extra 50,000 tons, taking the total to 200,000 tons was being asked for in the destroyer category. The 1930 figure had been based on the assumption that Japan would allow her submarine tonnage to fall to 52,700 tons by 31 December 1936. In fact the Japanese had increased their submarine force and in 1935 were claiming a further increase over the London Treaty figures. Attempts to persuade the French and Italians to adhere to the Treaty had also proved unsuccessful. Therefore, the Admiralty considered itself justified in asking for increased destroyer tonnage.

> 'At the present time France has 83 submarines of total tonnage 78,118 tons. Seventy four of these vessels are under-age. During the period of the London Naval Treaty there have been no indications of a substantial reduction in her submarine tonnage, and reports from Japan show

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1. Foreign Office, 19 May 1936, ADM 116/3376, A4241/4/45, London Naval Conference, 1936, 'Memorandum on the Proceedings and Results of the Naval Conference: Section 2, 1-10.' (Henceforth quoted as 'London History'.)

> 'that the latter is likely to increase her submarine threat considerably as soon as she is free to do so. Italy has 67 submarines (49,242 tons) built and a further 12 vessels (7,830 tons) building.'[2]

Moreover, the Admiralty had allowed the Germans 40,000 tons of submarines and 150,000 tons of destroyers was now only considered satisfactory if the French, Italians and Japanese accepted submarine forces of 40,000 tons. This was clearly unlikely and therefore irrespective of any Conference decision a large increase was necessary in the Royal Navy's destroyer tonnage.

Despite the standard British plea that, 'submarines should be abolished, the foreign Powers represented, as was only to be expected, have been unable to accept this point of view.'[3] The net result was an increase in the submarine tonnage demands of all the invited Powers. In spite of the early withdrawal of the Japanese delegation, over the British and American refusal to grant them parity in all categories,[4] a treaty was concluded on 25 March 1936. It contributed no new limitations or reductions in the submarine category, although all the participating Powers, plus Japan, did agree to sign a separate agreement covering submarine operations against merchant ships. The Germans also agreed to sign the document, known as the London Submarine Agreement which was a continuation of the Root Resolutions and Part IV of the London Naval Treaty and if adhered to gave the Admiralty a powerful weapon against the submarine.

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2. Admiralty, 4 Dec. 1935, Documents on British Foreign Policy, 2 ser., XIII, 719, 'Memorandum on the Retention of Cruisers and Destroyers in Excess of the London Naval Treaty.'

3. 'London History', 4.

4. British Delegation, 14 Jan. 1936, D.B.F.P., 2 ser., XIII, 771, 'Record of Meeting Between United Kingdom and United States Delegations.'

> 'Under this treaty,a submarine, when stopping or sinking a merchantman, was required to act in the same manner as a surface ship. The fact that the merchantman carried guns mounted "for the sole purpose of self-defence" did not absolve the submarine from this obligation, and the vessel in question was regarded as still retaining its full character, under international law, as a merchant ship and as being therefore entitled to the appropriate degrees of immunity. In practice, this meant that the submarine, acting in accordance with the Prize Ordinance, would have to remain surfaced while stopping and searching any merchantman. If then it was to be justified, according to the conditions laid down in the Prize Ordinance, in sinking the vessel, the submarine was first required to take measures to ensure the safety of the ship's company. As the lifeboats carried by merchantmen were not regarded as adequate for this purpose on the high seas, the submarine was required to take the crew aboard or, since this would generally prove to be impracticable, to refrain from sinking the ship.'[5]

The important factor was whether such an agreement would be adhered to.

However, Germany's adherence to the London Agreement depended on the worth of Hitler's word. This could not be openly doubted, for political reasons, and to publicly declare support for the convoy system would indicate that the belief was that the Agreement would be deliberately broken. Professional opinion firmly believed that: 'Although Germany has adhered to the rules of submarine warfare contained in Part IV of the London Naval Treaty, 1930, we cannot rely for our security on her observance of these rules.'[6] However, if the Agreement were adhered to then valuable time would be provided to augment existing A/S forces. For that reason many continued to cling to the belief that, because unrestricted submarine warfare in 1917 had brought the U.S.A. into the War and led to the defeat of the Kaiser's Germany, then such a tactic was unlikely to be repeated a second

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5. Doenitz, op. cit., 11-12.

6. Admiralty to Defence Plans Sub-Committee of C.I.D., 29 Apr. 1937, CAB 27/648, D.P.(P) 5, 'A New Standard of Naval Strength,' 16.

time, and certainly not in the opening stages of a war in which the United States remained a neutral.

In many ways the London Naval Conference proved to be not the last of the naval disarmament conferences but the official starting point of world naval rearmament. The long period of military neglect and belief in disarmament precluded any sudden reversal from the policy of retrenchment but the Conference provided a focus for a gradual realisation, in the face of the policies of Germany, Japan and Italy, of the need to restore British military strength. After the failure of the London Conference it became clear that there would be a further decline in the proportionate strength of the entire Royal Navy unless Britain followed the other naval Powers and undertook extensive new construction. Despite the provisions of the 1936 Treaty, 'political conditions had so greatly changed by the end of 1936 that the three parties concerned agreed to waive to some extent the provisions of the Treaty for a reduction in the total tonnage of Cruisers, Destroyers and Submarines.'[7] One of the changes in political conditions occurred on 7 March 1936 when the Germans, taking advantage of the crisis over Mussolini's invasion of Ethiopia, reoccupied the Rhineland. Although Britain and France denounced this action on 12 March there was no likelihood of military action. The Rhineland Crisis had highlighted the vulnerable position of the Royal Navy in the event of war with Germany since so much of its strength was committed to the Mediterranean. In addition, the crises exposed the impossibility of fighting a simultaneous naval war in Europe and the Far East. The message that naval rearmament needed to be speeded up was now unmistakeable. As well as new construction, stocks of stores, especially ammunition and fuel oil, needed to be replenished after being severely run down over a period of years. Once the 1930 London Naval

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7. Admiralty, 1936, ADM 116/3596, 'Naval Disarmament since the War.'

Treaty expired on 31 December 1936, the Admiralty wanted to be ready to initiate new construction, principally battleships and cruisers. As a result the Navy Estimates, introduced on 4 March 1936, totalled nearly £64 million, approximately £10 million above those of the previous year. In April the total was raised to £80 million as a result of a Supplementary Estimate and illustrated, in comparison with previous Estimates,[8] just how low British naval strength had been driven by the economic policies of successive Governments.

The A/S Position

To help counter the submarine threat, four flotillas of old destroyers had been converted but these vessels could not be considered as anything but a temporary palliative. The conclusion that the decision was forced by the financial stringency of the Government must be tempered by the First Lord's statement that minimum destroyer requirements were 22 flotillas for all theatres, which differed little from the figure given in 1934. This ignored the deterioration in the international situation in the intervening period and the Naval Staff's new assessment that over 100 A/S escort vessels would be needed for European waters alone. The Admiralty's attitude on the submarine threat to merchant shipping remained one of blithe confidence, 'that the anti-submarine measures which have been developed since the war would ... greatly lessen the effectiveness of the submarine as a weapon against shipping.'[9] However, differences existed over how best to use the A/S forces. In addition to the role of convoy escorts a revival of support for the 'hunting-group' system, discredited in the First World War, was bolstered by the signing of the London Submarine Agreement.

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8. See Appendix: C.

9. Admiralty, 26 Feb. 1937, ADM 116/3596, 'Notes for the 1937 Naval Estimates.'

> 'Should the enemy conduct his operations strictly in accordance with International Law the menace to our trade in Home Waters cannot be considered severe and our shipping will be allowed to move independently ... We hope from the outset to be able to undertake a heavy offensive against enemy submarines at sea and this will be conducted by groups of anti-submarine striking forces.'[10]

Even if the enemy submarines were to attack obligingly on the surface, the 'hunting-group' system could only work where naval forces were close to the position of any merchantman under attack. This was feasible in coastal areas but not in mid-ocean. However, the hope was that this very remoteness would protect merchant shipping when outside the range of existing A/S escorts. In the event of an enemy adopting unrestricted submarine warfare from the start of a war, the Admiralty plans called for 'the immediate adoption of convoy and escort as an antidote.'[11] If unrestricted warfare was adhered to, then A/S tactics were to be based on the 'hunting-group' and merchant shipping would sail independently.[12] This ignored one lesson of 1917; that convoys were not subject to delays unlike independent sailings by a route being declared dangerous. The sinking of the 'Athenia' (against Hitler's orders) on 3 September 1939 removed any indecision and forced the adoption of convoys, albeit with insufficient escorts. At the same time another echo of concern was voiced over the shortage of A/S escorts. 'In the opening stages of the war the naval forces available are hardly adequate to provide fully effective numbers for escorting our convoys.'[13] Nevertheless, because of the priority awarded

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10. Admiralty, 1937, ADM 116/3379, 'Memorandum on Trade Protection.'

11. Ibid.

12. D.D. of P., 26 Nov. 1939, ADM 1/10084.

13. ADM 116/3379, 'Trade Protection.' (See Note 10.)

to screening the fleet, proposals were made for reducing the number of A/S escorts to one per convoy. Justification for this dangerous policy rested on the dubious grounds that, 'ships in an inadequately escorted convoy are safer from submarine attack than if sailing singly.'[14] Moreover, the belief in the superiority of Asdic remained strong, allowing the erroneous contention that fewer escorts would be needed than in 1917-18. This neatly solved the nagging problem of insufficient numbers but left the risk that if the theory proved erroneous in wartime, then little or no time would be available to rectify the situation. Evidence of Asdic fallibility was to be provided by the last Combined Fleet Exercise in peacetime, when attacks by submarines on the fleet resulted in only one of them being detected.[15] Condemnation was swift and accurate, 'to collect a large number of valuable ships into a small space without adequate protection was making a gift to a submarine.'[16] Moreover, such concentration of shipping provoked views on the possibility of heavier losses from air attack. The Admiralty's answer was to point to A/A gunfire as an adequate deterrent. Events during 1939-40 were to shatter rudely any belief in the impotency of anti-shipping air attacks.

The basis for the dilemma over the use of A/S forces stemmed from the fact that British A/S training and the assessment of the tactics likely to be adopted by an enemy were based on British submarine training and tactics. German 'wolf-pack' tactics were to make nonsense of the British belief that submarines would be forced by A/S escorts to attack from long-range (over 3,000 yards) thus reducing the danger of fatal hits. Moreover,

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14. ADM 116/3873, Mar. 1939, 'Combined Fleet Exercise "XZQ".'

15. ADM 116/3379, 'Trade Protection.' (See Note 10.)

16. D.C.N.S., Vice-Admiral William M. James, 3 Mar. 1938, ADM 1/9501, 'Convoy Policy: Comments on Memorandum Submitted by D. of P.'

British tactics were based on the perceived operational use to which their submarines would be put and with only 40-50 submarines the emphasis was on solitary attacks, especially enemy warships and not large, slow merchant convoys. Exercises were tried with submarines attacking in groups but only in terms of operating as one and not independently once a target had been found. The object remained purely that of increasing the number of hits and the idea was dropped because salvoes could not be fired simultaneously by all submarines of the group.[17] However, efforts were made to test the system of placing a line of submarines ahead of a convoy, which was restricted to 10 knots. Submarines were allowed to manoeuvre on the surface but had to attack submerged and the boats were not allowed to communicate by wireless.[18] Naval exercises seemed to have been designed more for the air and sea escort forces and the submarine results, not unnaturally, were disappointing. German submarine attacks on the surface at night also came as a surprise to the British since, 'night encounters have been carried out on a few occasions only, particularly with the Fleet and Commanding Officers have as yet little experience of this side of submarine operations.'[19]

However, the Admiralty remained mainly concerned about the surface-raider threat to convoys and the submarine menace was considered less serious. 'The Admiralty are satisfied that the greatest potential danger comes from the surface raider and it is a danger which can only be met by

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17. Tactical Division, July 1931, ADM 186/481, 'Progress in Torpedoes, Mining and Anti-Submarine Warfare.' (P.T.M.A.S.), C.B. 3002/30, 22.

18. Tactical Division, 1938, ADM 186/159, Exercises and Operations, C.B. 1769/38, 'Exercise Z.P., 14-15 March 1938.'

19. Tactical Division, Apr. 1937, ADM 186/540, P.T.M.A.S., 1936, 35-37.

'having sufficient cruiser strength.'[20] Initial policy was to press for a return to the minimum figure of 70 cruisers, reduced to 50 at the 1930 London Naval Conference, and the increase was to be achieved in the short-term by the retention of over-age tonnage. Admiralty plans also called for large numbers of merchant ships to be taken over and converted to the armed-cruiser role. However, this deprived the country of the fastest and most modern merchant vessels and went some way towards hampering the supply position in war.

Increases in Submarine Construction

The signing of the London Naval Treaty of 1936 opened up a period of naval rivalry accentuated by the developing international situation. The Defence Requirements Committee (D.R.C.) had called for a 'New Standard' of naval strength, initially to rectify 'deficiencies' in equipment. In the submarine category this led to a Supplementary Estimate in July 1936 by which the number of boats in the 1936 and future construction programmes were increased.[21] The First Sea Lord supported the decisions of the Ministerial Committee on Defence Policy and Requirements under which it was prepared to increase the 1938 and 1939 submarine programmes to seven boats per year, in addition to the eighteen boats on order up to the 1937 programme. This was, 'a rate of building larger than would be explicable on the score of replacement.'[22] Despite this admission of the growing seriousness of the situation in Europe and the Far East, the new orders

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20. Admiralty, 26 Feb. 1937, ADM 116/3596, 'Notes for the 1937 Naval Estimates.'

21. Board Minute No. 3380, 24 June 1936, ADM 1/9037, M.F. 15113, '1936 Supplementary Naval Estimate.'
See also: Appendix: G(13).

22. Chatfield, 20 Oct. 1936, ADM 167/95, '1937-39 Naval Construction Programmes.'

only equalled the number of submarines either over-age or due to become over-age by 1939. Nevertheless, the new requirement showed how unrealistic the pre-London Conference figure of 40 submarines had been.

The D.R.C. report had not referred to the question of submarine strength since it had been hoped to secure a limitation of such tonnage at the London Naval Conference. The failure of the Conference to produce a tonnage limitation agreement led to a reassessment of British requirements under the proposed 'New Standard'. The result was a return to the figures of the late 1920's and a target of 82 submarines. 'It was proposed at the same time that the building programme should be seven vessels per annum, and that priority should be given to the construction of general service patrol submarines.'[23] Despite the desire to expand the Navy, a limit existed on the rate of new construction, because of limited shipbuilding capacity. The restrictions on naval building imposed by successive arms limitation treaties and Government retrenchment policies had resulted in extensive deterioration, and even destruction, of construction facilities, plus the dispersion of skilled manpower. Therefore, before any new orders could be laid down these firms needed financial aid from the Government to expand facilities. Nevertheless, the 1936 submarine construction programme had been doubled to eight boats, and additions made to future programmes. The Submarine Service found that the submarine continued to be placed low in the order of building priority. Apart from the naval dockyards only three firms, in 1936, were engaged in submarine construction. Of these, only Vickers-Armstrong and Cammell-Laird had facilities for large scale expansion. Moreover, these firms had orders for other categories of warship which further hampered any proposed increase in submarine strength. Despite these handicaps, these two firms plus

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23. Ibid, Section E - Submarines, 10.

Scotts of Greenock were to provide the majority of British submarines between 1939-45, with the emphasis placed on existing designs, to speed production. Meanwhile, pending experience with the first three 'U' class, submarine construction was to be concentrated on the 'T' class until 1938.[24] Revised figures set the estimated total of submarines at 62 by April 1939 and 70 twelve months later, assuming one year of war and in the unlikely event that there would be no war losses.

The Admiralty remained at pains to point out that although the increase in submarine numbers might be considered substantial, 'it is small in comparison with the strength of France, Italy and Japan, and trifling compared with that reported to belong to Russia.'[25] The climate of opinion both in the country and in Parliament still favoured no major increase in armaments. Therefore, although faced with evidence of expanding foreign naval forces the Admiralty had to adopt a cautious approach in the request for further naval construction. Despite the demise of quantitative tonnage limitation the view remained that although the submarine could be considered a possible danger, 'the Admiralty are confident that the anti-submarine measures which have been developed since the War would in any case greatly lessen the effectiveness of the submarine as a weapon against shipping.'[26] 'Greatly lessen' was no substitute for destroy and the weakness in numbers of A/S escorts was now painfully realised, as was the inability to provide a rapid increase in new construction. Nevertheless, despite the possibility of opposition on financial grounds in Parliament it was declared officially that the naval construction programme had been drawn up in

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24. Board Minute No. 3421, 16 Nov. 1936, ADM 167/94, '1937 New Construction Programme.'

25. ADM 116/3596, '1937 Naval Estimates.' (See Note 20.)

26. ADM 116/3596, '1937 Naval Estimates.' (See Note 20.)

order, 'to achieve as early as practicable a modern Fleet of the strength called for by the political formula upon which the Government decided in 1932,'[27] namely the 'New Standard'. The Admiralty considered that approval of this would clearly signal the end of retrenchment and a total of 148 warships was proposed under the 1936 and 1937 programmes.[28] The problem of interference by Government policies was not yet entirely eradicated and in December it was announced that the projected force total of 80 submarines was to be cut by seven, 'in order to effect some economy on the future cost of the Navy.'[29] This decision was taken despite the later assurance that the initial figure had been arrived at after: 'Taking into account both money and the German Treaty.'[30] As a means of further economy, submarines were also to be retained for sixteen years before being classified as over-age, despite long opposition from the Submarine Service on the grounds that such an extension would be dangerous. Even a reduced force total of 73 was not certain, since this could only be achieved by 1943 if 22 submarines were included in the 1938-1941 programmes. This necessitated the proposal to order seven boats in 1938 and five in each of the succeeding years.

British Naval Policy in the Far East, 1937-38

Meanwhile, the increasing danger of a simultaneous war in Europe and the Far East posed grave problems for naval planners. Ever since the First

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27. Admiralty, 12 Feb. 1937, ADM 167/99, C.P. 61(37), '1937 New Construction Programme.'

28. Admiralty to D.P.R. Sub-Committee of the C.I.D., 29 Apr. 1937, ADM 116/3631, 'Memorandum on the Proposed New Standard of Naval Strength.'

29. Chatfield to Board, 9 Dec. 1937, ADM 167/97, Board Minute No. 3503.

30. D. of P. to First Lord, 21 Dec. 1938, ADM 1/9728, P.D. 07345/38, 'British Future Submarine Strength in the Light of German Submarine Building.'

World War the Royal Navy had retained a slim superiority, despite the demise of the Anglo-Japanese Alliance, over both the Japanese Navy and the strongest European navy. This calculation presumed a neutral and friendly United States. However, successive naval disarmament conferences had reduced the margin of superiority and the building programmes of Japan and Germany threatened to destroy it. The British response had been two-fold, leading to the Anglo-German Naval Agreement and a call for a 'New Standard' of naval strength, 'maintaining the naval "status-quo".'[31] The latter, if achieved, was considered to allow a strong fleet to be transferred to the Far East in the event of conflict, while retaining sufficient naval strength in European waters to deter an aggressor.

The situation was considered to be sufficiently serious for the Admiralty to authorise a series of meetings with representatives of the United States Navy on the possibility of naval co-operation in the event of a serious deterioration in the Far East. The conversations were designed to lead only to an understanding and no firm treaty of alliance was envisaged. American proposals included the despatch of all their available capital ships to Honolulu. Admiralty policy remained based on sending a strong enough naval force to engage the Japanese Fleet. The main body was to consist of eight or nine battleships and one or two battlecruisers and included 25 submarines. However, the exact composition was subject to alteration, depending on the situation in European waters, and the quoted figures were only to serve as a general guide. Italy, as well as Germany, was now included in the Naval Staff's calculations of potential enemies in European waters. The Abyssinian crisis and then German and Italian support for the Spanish Nationalists had indicated the

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31. Admiralty, 19 July 1937, ADM 116/3631, 'A New Standard of Naval Strength,' Notes for 3rd D.P. Meeting, D.P.(P) 3.

vulnerability of British naval forces, especially in the Mediterranean, in the event of a simultaneous conflict in the Far East. Although subsequent events were to show the fears on the Italian threat to the Mediterranean to be exaggerated, nevertheless the Admiralty considered that it might have to rely entirely on the alternative route to the East via the Cape of Good Hope.

French Co-operation in the Mediterranean

In the event of a European conflict, the Royal Navy attached prime importance to protecting the vulnerable trade routes which converged in Home Waters. Loss of control of these areas, even temporarily, threatened grave consequences and possible total defeat. The Mediterranean also posed severe problems, especially if Italy were hostile since her geographical position threatened the passage of warships and merchant shipping through the central Mediterranean. Control of the western basin of the Mediterranean was eased, however, by the presence of the bulk of the French Navy and its strategically placed bases in southern France and North Africa. Therefore, agreement was reached with the French that in the event of war with Germany, they should assume responsibility for the western basin. This allowed the British to concentrate existing naval forces in the Mediterranean in the eastern basin without having to seriously drain naval forces from Home Waters. Merchant shipping was to be routed round the Cape of Good Hope to further reduce the strain on the Mediterranean Fleet.

Keeping open the sea route to the east remained an essential priority but clearly British naval strength was insufficient for this task in the event of a simultaneous conflict in the Far East and Europe. Sufficient forces did not exist to allow the stationing of strong fleets in Home Waters, the Mediterranean and the Far East. An adequate fleet to counter Japan could only be provided by the transfer of the majority of the

Mediterranean Fleet to the Far East. This move, in turn, depended on the French Navy assuming control of the whole of the Mediterranean.

Use of Submarines in Far East

The low strength of the British submarine force and the need for submarines to be stationed in Home Waters and the Mediterranean precluded sending the requisite numbers of submarines to the Far East, either for a 'holding' action until the arrival of the Main Fleet or for the reconnaissance and local defence roles. The latter included defence of Singapore:

> 'Operating in the South of the China Seas in conjunction with the shore based aircraft from Singapore, submarines should contribute materially to the security of the fortress. It is unfortunate that all the submarines at present stationed in China are by their design more suited for long oversea patrols than for patrol duties in restricted waters.'[32]

It had been intended that these submarines would be used in reconnaissance patrols or long-range interception of troop convoys. The latter role was now considered unlikely to produce substantial results because of the vast area to be covered and the limited number of submarines available. Nevertheless, the employment of at least one submarine in Japanese waters was hopefully expected to result in the Japanese mounting a full scale A/S operation indefinitely. Even these proposals assumed the survival of Singapore and a minimum of aggressive moves by the Japanese Navy pending the arrival of the British Fleet. Despite the realisation that in the event of simultaneous conflict with Germany and Japan it would be difficult, if not impossible to despatch a major fleet to the Far East, these proposals were approved.[33]

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32. C. in C. China Station, 10 July 1937, ADM 116/3863, 'Appreciation of the Eastern Forces During the Period Before Relief,' 99-100.
See also: Remarks by D. of P., Captain T.S.V. Phillips.

33. Plans Division, Oct. 1938, ADM 116/3673, 'Naval War Memorandum' (Eastern), Section X(D), Amendment No. 6.

Following the Japanese denunciation of the Washington Treaty, the Admiralty had been forced to reconsider, 'the important role which submarines will be called upon to play in "holding the fort" in the Far East ... and the inadequacy of the existing provisions in that respect.'[34] Despite the clear need for an immediate increase in submarine strength in that area, the new contingency plans called for the despatch of only ten submarines, to augment the fifteen boats of the China flotilla. The limited numbers available to cover both Europe and the Far East meant that Admiralty freedom of action was severely restricted. Even this limited proposal left only 27 submarines in Home Waters.[35] The immediate role remained: 'The security of the Singapore Base and its facilities.'[36] No alteration was envisaged in other operational roles although greater emphasis was given to the possibility for attacks on Japanese invasion convoys en-route to Singapore and not just in the vicinity of the base. Further possibility of offensive operations, however, was largely precluded both by the shortage of numbers and the fact that, despite the tactical views of C. in C. China Station, only the three 'G' class submarines of the existing British boats possessed the range to conduct effective Singapore-Japan patrols. Plans to operate the 'G' class with the Fleet had to be abandoned since even these boats could not maintain station.

The hope was that if the eventual British Fleet in the Far East proved either equal or inferior to the Japanese Fleet in capital ships

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34. D. of P., 12 Feb. 1934, ADM 116/3862, M.U. 0570/35, 'Disposition of Naval Forces: Phase 1 - War in the Far East.'

35. Plans Division, Oct. 1938, ADM 116/3673, 'Naval Plan - Dispositions: Phases I and II - Forces to be Despatched to Far East and Retained in European Waters, 30.9.38. - 30.1.39.'

36. D. of P., 1934, ADM 116/3862, 'Eastern War: Appreciation of the Situation of the Eastern Forces During the Period before Relief.'

then these submarines, 'might be able to influence the enemy's tactics ... by the threat of their presence.'[37] A weakness lay in this constant reliance on fighting a war by threat rather than physical contact but it was a solution largely imposed by shortage of numbers. Thus for planning purposes it was assumed that if Japan moved first against Hong Kong then British surface forces would be unable to counter with operations against Japanese sea communications. Nor were British submarines to be allowed to resort to unrestricted warfare. Instead the intention was to resort to economic pressure against Japan. Such assumptions precluded any possibility of a vigorous Japanese offensive, even if Britain became involved in a simultaneous conflict in Europe. Calculations indicated that to operate a continuous submarine reconniassance patrol off Japan from Singapore required a minimum of six boats as against only three if the patrol was based on Hong Kong. However, Hong Kong by its geographical position was likely to be one of Japan's initial targets. Therefore, submarines could not be certain of operating from there for more than a limited period. Moreover, the vulnerability of this base precluded the use of the 'S' class in the Far East because of their limited endurance. Nevertheless, existing plans called for six of these submarines to move with the Fleet to reinforce British forces in that area, despite their being considered more suitable for the confined waters of the Mediterranean and the Baltic. As such it was a reflection of the exigencies which had to be resorted to because of the limited numbers available. Official justification was that the 'S' class, 'would be suitable for employment on offensive patrols off Formosa and the Pescadores or against Japanese advanced bases on the China coast.'[38] Once again, these roles were dependent

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37. Plans Division, March 1938, ADM 116/3673, 'Submarine Operations.'

38. Ibid.

on the ability to operate from Hong Kong but only if, 'the facilities at that port,' are, 'sufficiently intact to enable them to do so.'[39]

Existing plans also called for the use of at least three 'Porpoise' class minelayers in the Far East despite the stated belief that:

> 'Conditions in the Western Pacific are not generally favourable for effective mining action against the Japanese. With the exception of the Rescardes area suitable objectives for offensive minelaying are so far from British bases as to preclude the continuous interference of enemy minesweeping forces in these areas. Moreover, tides are generally strong and the waters deep off the Japanese coast.'[40]

Nevertheless, the hope was that along with reconnaissance patrols, even minimal minelaying would require the Japanese to commit considerable naval resources. Again, this was simply a question of using every possible weapon. However, it is difficult to accept that the Japanese would have found one minelaying/reconnaissance patrol per month a serious inconvenience. The method of employment of British submarines in wartime was now dependent on whether the naval initiative was retained or conceded to the enemy. In the Far East, 'submarines would have to be employed in furtherance of the counter measures to possible or probably enemy movements and/or for reconnaissance,'[41] and this was a defensive posture leaving the initiative with the Japanese.

In terms of the effect of air power on naval operations, the Admiralty could not have been unaware of the growth of Japanese naval air power.

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39. ADM 116/3673, 'Submarine Operations.' (See Note 37.)

40. ADM 116/3673, 'Submarine Operations.' (See Note 37.)

41. Rear-Admiral (S), R.H.T. Raikes to C. in C. Home Fleet, Admiral Sir Roger R.C. Backhouse, 23 Feb. 1938, ADM 1/9540, 0.5, 'War Memorandum: Enclosure No. 1 - General Remarks Affecting the Employment of Submarines in War.'

Along with the United States, Japan had pursued a vigorous policy of developing an independent naval air policy whose equipment and tactics were specifically designed for the maritime environment. The Royal Navy had possessed no such opportunity following the incorporation in 1918 of the Fleet Air Arm into the Royal Air Force. The latter had therefore been responsible for the control, administration and operation of British naval air policy since 1924, a position which proved unsatisfactory for the Admiralty. However, within the Navy the prevailing view into the 1930's was one of using aircraft solely as an aid to naval actions decided by gun power. Gradual awareness of the developments of the Japanese and American navies led to a more positive belief in the capabilities of naval air power. Thus following a lengthy campaign the Admiralty regained control of the Fleet Air Arm in 1937 and under the 1936-1939 programmes six fleet carriers were ordered. More importantly the roles allocated to naval aircraft had altered towards acceptance of a more decisive part in naval tactics.

The use of aircraft against submarines had its origins during 1914-1918 but the difference in 1939 lay in the far greater range, speed and armament possessed by maritime aircraft. Unfortunately due to the hiatus in naval aircraft development which had persisted for so long in Britain effective matériel was not available in 1939. Nevertheless, this did not affect the theoretical development of tactics. The problem with using aircraft in the A/S role remained essentially that of detection. Clearly it was a physical impossibility to equip aircraft with Asdic and therefore the aeroplane was most dangerous when the submarine was surfaced. Initial roles logically centred on protection of the fleet, reducing the submarine's effectiveness by keeping it submerged. Although a submarine's range and speed could be reduced in this manner, submergence still conferred the cloak of invisibility and limited the aircraft's effectiveness.

In areas such as the Mediterranean the clarity of the water restored some of the aircraft's effectiveness since submarines could be seen, in the right conditions, down to 90 feet. This was not the case in the Atlantic and Pacific, except in coastal areas. Thus in considering reconnaissance or minelaying patrols in the Far East or the Baltic, the Admiralty needed only to restrict itself to expressing caution, as to the effects of aircraft in the A/S role, in coastal or shallow water areas. In these areas intense A/S activity of all kinds would be expected as a matter of course.

British Submarine Dispositions in European Waters

Submarine dispositions for a war with Germany proved less easy to define but the conclusion was that if the same strategy was employed as during the First World War then the dispositions should be similar with, 'concentration for short periods in particular areas,' being, 'preferable to dispersion over wide areas continuously.'[42] Proposed submarine bases were Rosyth (twenty boats), Blyth and Middlesborough (ten each).[43] However, Rosyth was needed for surface units[44] and the Submarine Service had to finally settle for the alternative proposal of Blyth as the main base and Hartlepool replacing Rosyth.[45]

On the question of the operational role of the British submarines in European waters, the Admiralty laid emphasis on the need for reconnaissance patrols to obtain early intelligence of enemy movements. This role involved surveillance of attempts by German surface units to break out against the Atlantic convoys and possibly the English East coast ports,

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42. Ibid.

43. See Appendix: I(1).

44. C. in C. Home Fleet, Admiral Sir Charles M. Forbes to Admiralty, 27 May 1938, ADM 1/9540, 962/H.F.00/200.

45. Raikes to Backhouse, 23 Feb. 1938, ADM 1/9540, 0.5, Enclosure No. 2, 3.

reflecting the Admiralty's continued concern with the surface-raider. Maintaining a watch on the exits from the North Sea was also the main role assigned to the aircraft of Coastal Command. Depending on whether the enemy engaged in unrestricted warfare, anti-submarine co-operation was assigned the next priority on Coastal Commands. Overall, the use of British submarines was based on the tactics employed by the German Fleet during the First World War, except that the German battle fleet was expected to be small by comparison. In the absence of new tactics by the Germans and any advances in submarine technology this was a logical policy to follow. It was also clear that the reconnaissance role in areas such as the Heligoland Bight would again fall heavily on the submarine forces and that once more the reporting of sightings of outward bound ships would take precedence over attacks on these vessels. The same problems would exist as in 1914-18, with up to seventeen hours of darkness in winter and with submarines at least fifteen to twenty miles apart even under ideal conditions. This meant that the possibility of enemy forces escaping detection would be high. 'In view of these factors it is questionable whether reconnaissance off the enemy coast in the winter would be worth the effort.'[46] Nevertheless, it was accepted that the first phase of employment of submarines against Germany would have to involve reconnaissance patrols in the Heligoland Bight. The placing of submarines close inshore was ruled out because of the expected heavy enemy A/S measures and minefields. The remaining submarines, minus the minelayers, were to be stationed in the Skaggerak. One major alteration from the previous conflict was to be the use of aircraft in the maritime reconnaissance role in place of certain submarine patrol lines. However, certain factors

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46. Ibid, Enclosure No. 2, 4.

reduced their effectiveness including bad weather, especially prolonged in winter, and the inadequate range of existing aircraft. The Anson, with a range of only 500 miles could not even reach the Norwegian coast. Therefore these areas had to be covered by submarine patrol until the arrival of more effective aircraft purchased from America. The disposition of all British submarine patrol lines, bedevilled by shortage of numbers, were to be dictated by two assumptions. These were that the Dover Straits would be mined, restricting German surface and submarine raiders to the passage between the Shetlands and Norway, and that the Germans would use their surface ship and submarines to attack British trade outside aircraft range, leaving the air force to deal with British bases and coastal trade.[47] Despite this assumption, Rear-Admiral (S) remained in favour of retaining some submarines in the coast defence role; this ignored their failure in this role in the First World War. If there had been a surfeit of submarines it is possible that such a proposal could have been viewed as a safety factor in terms of covering all potential threats.

In reality, only 27 submarines were expected to be available by early 1939 with another six months before any reinforcements became available. Therefore only eight to ten boats could be maintained on patrol in the Heligoland Bight.[48] To consider using submarines in a coast-defence role could only have a detrimental effect on other patrol areas, especially with only sixteen submarines ready for war in Home Waters in March 1938,[49] plus three refitting and eight in Reserve. Omitting the minelaying submarines

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47. ADM 1/9540, Forbes to Admiralty. (See Note 44.)

48. Raikes to Backhouse, 23 Feb. 1938, ADM 1/9540, 'Enclosure No. 3, Factors Affecting the Organisation of Submarine Patrols,' 1.

49. Admiralty, 31 May 1938, ADM 1/9379, 'State of the Fleets: Part 1.'

reduced the total available for patrol duties to fourteen. In August, because of the worsening situation with Germany, Rear-Admiral (S) decided to allocate all available suitable submarines to patrol duties and carry out training with boats from the Reserve. Even by making reductions in the number of submarines available for the Heligoland patrol there were still insufficient boats for other North Sea patrols. Further complications were added by a lack of clarity in portions of the Admiralty's operational orders. Thus, submarines on the Norwegian patrol were to be allowed to attack any warships sighted but only if, 'no undue delay in reporting the enemy will be caused.'[50] It was only after a definite request by Rear-Admiral (S) that the time period was clarified as being one hour.

It was expected that submarine numbers would improve slightly by June 1939, assuming no war before then, to a total of 25 boats plus eight 'H' class with the training flotillas. Moreover, the expectation was that by the spring of 1939 there would no longer be a need to maintain the Norwegian patrol, thus freeing boats for other patrol duties. Nevertheless, the situation on numbers clearly remained far from satisfactory. Definite dispositions, based on the numbers available, were approved by the Admiralty on 28 September. Aberdeen now replaced Middlesborough in the list of bases.[51] This ensured that some boats were as far north as possible so as to reduce time spent travelling to and from patrol areas. The new 'T' class were to be based at Blyth as they became available and the 2nd and 3rd Submarine Flotillas were under the direct command of Rear-Admiral (S) who was to move from Portsmouth to Rosyth in wartime.

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50. Raikes to Forbes, 18 Aug. 1938, ADM 1/9540, O.5, 'War Memorandum.'

51. Raikes to Admiralty, 11 Sept. 1938, ADM 1/9537, F.A.1., 'Submarine War Orders - Germany.'

Weakness of A/S Forces - Crews

The Munich crisis, in the autumn of 1938, served to highlight several aspects of the inadequate level of British naval strength, including, in addition to the shortage of hulls both in the submarine and A/S categories, a shortage of specialist manpower in the Submarine Detector Branch. In this instance a major reason was the failure to provide enough submarines in the A/S training role. The Admiralty remained confident about the efficiency of Asdic. However such confidence depended on the existence of several factors, including the need for the submarine target to remain submerged and provided sufficient qualified Asdic operators were available for all the vessels that needed them. This was, in itself, a reflection of the attitudes and atmosphere of the period in which naval defence establishments had been allowed to decline to the level where more and more categories of men and ships tended to be regarded as specialised and therefore superfluous in the interests of economy. Thus, in the early 1920's the need for submarines for training A/S flotillas had been advanced as a major reason for British retention of the submarine. In the autumn of 1938 it was belatedly recognised officially that not only could the extra Asdic operators not be provided from Reservists (due to it being a specialised function) but that there was little likelihood of providing the necessary training submarines in the immediate future. 'The shortage of submarines for A/S "instruction" at Portland and for subsequent A/S "training" all over the world has been frequently stressed.'[52] Now the inability to provide sufficient training submarines was defined as shortage of crews and it was proposed that at least two submarines from Reserve

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52. D. of T.D., 24 Nov. 1938, ADM 1/10092, T.D. 586/38, 'A/S Training.'

should be used for A/S instruction.[53] Other than this there was little hope of an early improvement in numbers. 'Unfortunately the continued failure of the "T" class submarines to come up to their completion dates has upset the forecast for the various submarine flotillas for March 1939.'[54] In addition, the proposal for the 'T' class to relieve submarines from the 5th Submarine Flotilla at Portsmouth and increase the number of boats at Portland was therefore unlikely to be fulfilled until after March. The proposition to bring forward the necessary two submarines from Reserve, for use in A/S training, was also considered impractical since the officers and crew would have had to be taken from submarines in full commission at Portsmouth or with the Home Fleet. This would merely have compounded the problems for the Fleet which was already short itself of submarines for A/S training. Ten 'T' class were expected to be completed during 1939, allowing the older submarines to be placed in Reserve. However, this was not expected to lead to an immediate increase in numbers available for A/S training, since submariners had to be retained to train for the new boats. Nevertheless, it was still hoped to provide the two submarines for A/S training before March 1940.

Naval Rearmament - General

Meanwhile, the Admiralty was once again engaged in a prolonged struggle with the Treasury for resources. Initial plans for rearmament in the early 1930's had been to replace the Fleet on a One-Power Standard, although the Admiralty proposed a 'New Standard' of naval strength taking into account problems posed by developments in the Far East as well as Europe. Based on the recommendations of the D.R.C. the submarine requirement was set at 55. In November 1935 the 3rd report of the D.R.C. had

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53. D. of P. to D.O.D., 16 Dec. 1938, ADM 1/10092.

54. D.O.D. to D. of P., 21 Dec. 1938, ADM 1/10092.

proposed a 'New Standard' equivalent to a Two-Power Standard and taking into account the possibility of a simultaneous war with Germany and Japan. On 20 January 1936 the D.P.R. Sub-Committee had directed the Admiralty to prepare a naval programme to give effect to the 'New Standard' as soon as possible and the 1936 and 1937 programmes approximated to the level necessary to achieve this target. The Admiralty's proposals were considered on 11 May 1937 and the D.P.R. decided, despite the gravity of the international situation, to postpone any definite recommendations to the Cabinet. Admiralty pressure had brought little change in the situation with the Treasury by early 1938.

On submarines, the Treasury calculated that this section of the D.R.C. programme, originally planned to be spread over seven years, would be exceeded in three. Moreover, Admiralty proposals to build up the Fleet to the D.R.C. standard at an accelerated rate were regarded as being equivalent to the almost complete cessation of naval building during the last four years of the seven year programme. The size of the 1938 programme was also objected to on the grounds, 'that to lay down a very large programme in 1938 following two very large programmes in 1936 and 1937 would lead to the bunching of a vast programme of expenditure into a relatively short space of time.'[55] Therefore, the Treasury suggested that the Admiralty should consider a smaller programme which would not incur expenditure for a Fleet beyond the D.R.C. standard. The Admiralty's original programme for 1938 was £70 million and a reduction was expected of £34 million. Meanwhile, the Government continued to favour economy in the Estimates and the Minister for Co-ordination of Defence had indicated that it might be necessary to ration the three Services. Therefore, the Board agreed to

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55. Board Minute No. 3518, 3 Feb. 1938, ADM 167/102, 'New Construction Programme 1938.'

the First Lord's proposals that because of existing reductions in the 1938 Estimates these should be reduced but only to £45 million. Under these measures the 1938 submarine programme was to consist of only three 'T' class.[56]

The First Lord emphasised, however, that he and the Board viewed such a move with misgiving. If the D.R.C.'s recommendations remained accurate and there were no reductions in the German and Japanese Fleets then it was dangerous even to consider a reduction in the Admiralty's estimate of the forces necessary to counter any potential threat to the nation and the Empire. Further, 'it must be borne in mind that since the D.R.C. gave the directions on which the Admiralty have acted the international situation has not improved but deteriorated. Germany has grown more powerful and Japan less friendly.'[57] This point had been emphasised to the D.R.C. Sub-Committee on 29 April 1937. Failure to implement the 'New Standard' was stated to have serious consequences for Imperial defence.

> 'When the capital ships now building in Europe are completed, it would not be possible on our existing standard of naval strength to safeguard the Empire in the Far East if already engaged in war in Europe; even with Germany limited to 35% of our own strength, we could never take the risk of despatching to the Far East a sufficient fleet to act as a deterrent to Japanese aggression.'[58]

Nevertheless, even if the gravity of the situation had been accepted, increasing the Fleet up to the 'New Standard' could not be completed before 1942 and even this time scale was not possible under the existing financial

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56. Board Minute No. 3530, 25 Feb. 1938, ADM 167/102. (Three 'T' and four 'U' class had been approved under Minute No. 3503 on 9 Dec. 1937.)

57. First Lord of the Admiralty, Alfred Duff Cooper to Sir John Simon, Chancellor of the Exchequer, 27 May 1938, ADM 167/102.

58. Admiralty to D.P.R. Sub-Committee of C.I.D., 29 Apr. 1937, CAB 16/82, D.P.(P) 3, 'Memorandum on New Standard of Naval Strength.'

limits of £1,600 million to the three Services over five years. Moreover, given the weakened shipbuilding capacity, during the period up to March 1942 a construction programme equivalent to the 'New Standard' was the maximum effort which could be accommodated. It had to be accepted that, 'even the so-called New Standard programme will not provide by 31 March 1942 a Fleet adequate to meet the strategic requirements of the situation. The smaller Fleet produced by the so-called D.R.C. programme would be quite hopelessly inadequate.'[59]

In practical terms the earliest time by which an adequate construction programme could be completed was 1946. The dangers in allowing the disparity to increase were emphasised during July since, 'the delay in our attainment of the New Standard of naval strength may well place us at an ultimate disadvantage as compared with potential enemies since our proposals for the New Standard and the rate of achieving it were based upon known or expected developments.'[60] The uncertainty that pervaded naval planning stemmed from the failure to take a political decision on the long-term naval standard required. The Treasury considered the D.R.C. Fleet remained the official policy on this issue while the increases in the 1936-38 Navy Estimates had only been intended to increase the rate at which this Fleet level was achieved. However, the Admiralty maintained that it was a misapprehension to believe,

> 'that the D.R.C. fleet is something which has the approval of the Cabinet whereas the New Standard fleet is an unauthorised project. As a matter of fact the D.R.C. fleet has had no substantial foundation since the death of quantitative limitation and neither can be

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59. ADM 167/102, Board Minute No. 3530. (See Note 56.)

60. Duff Cooper to Sir Thomas Inskip, 21 July 1938, ADM 1/9672, 'Naval Expenditure, 1937-41.'

> 'said to have the approval of the Cabinet. We have, however, since 1936 been working on a hand to mouth policy without a decision as to the ultimate strength of the Fleet.'[61]

The result of this uncertainty was to increase the difficulty of preparing war plans, strategic dispositions and even such general items as organisation and training. This was seen as reducing the Navy's ability to fulfil its role in the nation's foreign policy. However, the Cabinet accepted that demands by the other Services would make it impossible to attain the 'New Standard' and the actual level of strength would have to fit the financial resources available.[62] This decision carried a considerable risk with it, that emphasised how much time, as well as money, had become an important political factor.

German Claim to Build up to 100% of British Submarine Strength

On 10 December 1938, the German Government announced its intention to exercise its rights under Article 2 (f) of the 1935 Anglo-German Naval Agreement and increase German submarine tonnage to parity with the British force. In reply the British Government proposed a series of discussions as provided for under the 1935 Agreement. The German decision was expected to have an adverse effect on British public opinion which was considered as possibly useful in any attempt to dissuade the Germans from their decision. The Government were apprehensive over the German reason, given as Soviet naval expansion, since theoretically if their object was merely to increase the security of communications then only coastal submarines were necessary. However, indications were that a large number of ocean-going boats were to be included. If construction was restricted to the smaller submarine then the British Government had little objection. Nevertheless,

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61. Ibid.

62. Cabinet, 20 July 1938, CAB 33/38, 'Memorandum on New Standard of Naval Strength.'

it was not expected that, 'the German representatives will be in a position to return a favourable reply to the above suggestions as regards the submarines.'[63] Therefore, the British naval representatives were not empowered to make any decisions without reference to London. The discussions were not expected to go well since it was assumed that the Germans would use the discussions to place responsibility for increases in naval armaments on British naval mobilisation during the Munich crisis and a supposedly anti-German basis to British rearmament policy.

Therefore, expecting a difficult set of discussions the naval delegation arrived in Berlin on 30 December 1938 to present the British proposals. The Germans had already allowed for the effect on British public opinion of the increase in submarine tonnage when signing the 1935 Agreement since this publicly gave them the right to achieve parity with the British submarine force.[64] The British representatives argued in vain that the only circumstances under which it had been agreed that an increase over 45% could be contemplated involved international agreement on submarine parity and a decrease in British tonnage below 52,700 tons. No parity agreement existed and the total British tonnage was now 70,000 tons, so there was no reason for any increase by the Germans. Information reaching the Admiralty had made it clear that Germany's total projected submarine tonnage by December 1938 was to be 32,000 tons. Prior to the discussions with the German Naval Staff it had been stated that:

> 'The latest submarine figure we announced to Germany was one of 70,000 tons which gives Germany the right to 31,580 tons if she uses her 45% quota. This figure ought to suffice

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63. Foreign Office to British Delegation (Berlin), 28 Dec. 1938, ADM 116/3765.

64. British Delegation, 30 Dec. 1938, ADM 116/3765, 'Records of a Meeting Held at the German Marineleitung.'

> 'to meet her "absolute" requirements for the defence of her coasts which have not increased since 1935.'[65]

However, the Germans were committed to claiming the increase up to 100% despite evidence that resources allocated to naval building would not allow more than 40,000 tons to be laid down prior to 1940. Attempts to persuade the Germans to accept a maximum limit of 60% were also unsuccessful and the talks ended in total failure. Moreover, any possibility of renewing these discussions was quashed when on 28 April Germany abrogated the Anglo-German Naval Agreement, claiming anti-German policies by the British Government, following the British guarantee to Poland.[66] By September 1939 the Germans had completed only 30,000 tons, amounting to 55 submarines, of which only 26 were ocean-going models. In order to have exceeded this total legally the Germans had to both invoke Article 2 (f) and later abrogate the Agreement. Although political requirements prevented this move at an earlier date an additional major factor in ensuring the survival of the Agreement for four years was a preference among senior German naval officers for a surface fleet rather than a large submarine force. Certainly, as Germany had demonstrated, the submarine could be easily mass-produced and pre-fabricated using both waterside and inland shipyards.

The German actions generated intense discussion on ways of increasing future British submarine strength. A variety of proposals were produced, all centring on the retention of over-age tonnage, since the issuing of

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65. D. of P., 23 Dec. 1938, ADM 116/3369, 'Discussions with the German Naval Staff.'

66. Viscount Halifax to Sir M. Henderson (Berlin), 28 Apr. and 23 June 1939, ADM 116/3369, A.3092/1/45 and A.4372/1/45, 'Documents Relating to the Abrogation of the Anglo-German Naval Agreements.'

new construction orders could not be immediately acted upon by firms already overloaded with orders for all categories of warships, most of which had a higher priority than the submarine. A force of 60 boats was already scheduled to be completed by 1943 and alterations in the 1939 programme increased this total to 67, allowing for six over-age submarines being retained. The 'ideal' force total was now calculated to be as high as 127 boats, which was approximately twice the total actually possessed by the Royal Navy in September 1939.

Despite this, while British naval strength was curtailed by financial considerations, limiting the submarine force was considered profitable, assuming the Anglo-German Naval Agreement remained in force. If the 'New Standard' programme had been accepted the resulting submarine total would have been 82, 'taking into account both money and the German Treaty.'[67] However, as a result of Treasury pressure during early 1938 the Admiralty had accepted a reduction to 73 boats. The conclusion remained that:

> 'Taking all considerations - strategical, financial and political into account, it seems best to adhere to our present forecast of tonnage of 70,000; submarine construction after the 1939 programme to be in replacement of over-age tonnage and not additional.'[68]

This was a conclusion which found favour with several members of the Board of Admiralty including the First Lord, First Sea Lord, and the Deputy Chief of the Naval Staff. Confirmation was given to a maximum force total of 71 submarines by 1943 but studies completed in February 1939 concluded that at least twenty extra submarines would be required in the first year of war.[69] Further deterioration of the political situation in Europe,

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67. D. of P. to Duff Cooper, 21 Dec. 1938, ADM 1/9728, P.D. 02345/38.

68. Ibid.

69. Admiralty, 17 Feb. 1939, ADM 116/3747, M. 07311/38, 'Enclosure B.'

however, quickly left the Admiralty with no choice but to revise the proposed submarine force total and to introduce an Emergency War Programme, doubling the 1939 programme from eighteen to 57 boats.[70] Nevertheless, these figures could do little to alleviate the immediate shortage prior to the outbreak of war and this was reflected in the British submarine dispositions, altered frequently over the next few months,[71] including such anomalies as 'Porpoise' class minelayers being transferred to the Mediterranean to act in the patrol role. The war was to prove the unsuitability of these and other large submarines for patrol work in this area, where the shallow and clear waters allied to intensive air and sea A/S patrols worked against them.

Unrestricted Submarine Warfare - British Attitudes to Attacks on Convoy

A major problem, apart from numbers, concerned the application and adherence to the London Submarine Agreement and the resulting effects of this and other Treaties. The standard operational roles of British submarines in wartime, whether these were attacks on enemy warships or reconnaissance patrols, were clearly understood. However, international agreements affecting unrestricted submarine warfare left some doubt, within the Submarine Service, over the position of British submarines in attacking enemy convoys, particularly those containing neutral shipping. Initial discussions had already taken place within the Admiralty when the issue was highlighted by proposals forwarded by Rear-Admiral (S). These

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70. Emergency War Programme Committee, 1 Apr. 1939, ADM 116/3747, G.02708/39.
See also: Controller, 7 Feb. 1939, ADM 116/3747, M.0960/39, 'Naval Hypothesis for Supply Board Work.'

71. Rear-Admiral (S), B.C. Watson to Admiralty, 2 Feb. 1939, ADM 1/9867, 75/05, 'Enclosure: War Organisation of Submarines in Home Waters.'
See also: Watson to Forbes, 3 Mar. 1939, ADM 1/9867, 0.5.
See also: Appendix: I(2).

emphasised the vulnerable position of British bases and possessions in the Mediterranean and the Far East. The C.I.D. had already concluded that aid for these areas from surface forces could no longer be regarded as certain in the event of war simultaneously with Germany and Japan. A more vigorous use of submarines in an attempt to rectify this situation was suggested, including surprise attacks on enemy convoys. One possible result was the alienation of neutral opinion which necessitated that such a policy should be clearly defined and announced as defensive.

Attacks on enemy trade were not included in these proposals since such a move, 'would be a retaliatory measure to be taken shortly after the outbreak of war in answer to the enemy's use of unrestricted warfare which was universally expected.'[72] Moreover, attacks on trade were considered to have little direct connection with protection of bases and possessions. 'Hostile' shipping in the vicinity of such areas was seen as a different case. Unlike the unrestricted U-boat campaigns during 1917-18 similar British submarine operations, if necessary, would be carried out, 'in a limited area for strictly defensive purposes against "hostile shipping" i.e. shipping which is being used to invade territory or to maintain invading armies.'[73] The 'limited areas' were to be created by declaring zones in the vicinity of bases such as Hong Kong, Singapore, and Malta as 'dangerous areas'. The area around Malta was to be extended to cover the sea communications between Italy and Libya in the event of war with the former. Submarines were to be instructed that convoys found in these areas and believed steering towards the British bases were, 'to be presumed

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72. Watson to Admiralty, 3 Aug. 1939, ADM 1/10360, 645/94, 'Remarks on the Use of Submarines in Defence of Territory.'

73. Ibid.

'hostile and ... to be attacked without warning.'[74] On the question of such action being used as an excuse by the enemy to begin unrestricted warfare the view was that:

> 'If there were the least hope that our enemies would refrain from attacking our trade with submarines, then perhaps it would be wise to await events even at the risk of losing our territory. But ... there is no hope of this and any delay on our part might have fatal losses without any corresponding gain ... our proposed action is strictly defensive and compared to unrestricted warfare is nearly if not entirely legal. It is therefore most unlikely that it could ever lead to the general recognition of unrestricted warfare.' Therefore, 'enemy convoys containing enemy or neutral ships known to be carrying troops or weapons such as tanks or aeroplanes; or containing vessels known to belong to the fighting services and carrying supplies may be sunk without warning. Ordinary merchant vessels in the convoy would have to take their chance of being hit.'[75]

One objection was that submarines could not know the contents of a convoy and therefore could not be certain their attack was justified, even under the above conditions. This was an erroneous view since submarines could be given the same information on shipping movements as surface warships.

Existing Admiralty policy laid down that,

> 'in enemy convoy only the escorting ships, troopships, auxiliary vessels belonging to the enemy fighting forces, or merchant ships known to be acting as auxiliaries in direct attendance on the enemy fleet, could be attacked without warning, although any ordinary merchant ship in the convoy would have to accept the risk of incidental damage.'[76]

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74. ADM 1/10360, 'Submarines in Defence of Territory.' (See Note 72.)

75. ADM 1/10360, 'Submarines in Defence of Territory.' (See Note 72.)

76. Head of M., 21 Aug. 1939, ADM 1/10360, M.07295/39, 'Attacks on Enemy Convoys.'

This policy differed from Rear-Admiral (S)'s suggestions in that any convoy vessel could be attacked, without transgressing the rules of restricted submarine warfare, so long as it was known that there was at least one vessel which could be justifiably sunk without warning. The expectation was that there would be no legal problem or difficulty with neutrals, if such an attitude were announced on the outbreak of war. Clearly, the danger existed of justifying the introduction of unrestricted submarine warfare by an enemy. The longer any nation could be induced by example or international pressure to confine submarine operations to agreed international rules the more time would be available to strengthen British A/S forces and the convoy system.

The likelihood of facing not only Germany or Japan but also Italy increased during the summer of 1939 and meant that the strength of British naval forces in the Eastern Mediterranean would be at a very low level. Loss of the Suez Canal route would clearly pose a severe threat to communications between Britain and the Far East, especially India. The position of Malta, provided it could be defended from invasion, was invaluable if it proved necessary to prevent Italian supplies reaching Libya. However, it was assumed that such convoys would be heavily escorted and the shortage of submarines was so severe that boats employed against such convoys would probably be fully occupied in attacking the escorts. This was a pessimistic view but one based on the 'worst case' philosophy and which recognised the extent to which the British submarine force would be stretched in the opening months of war. Nevertheless, 'with such a convoy the presumption that every vessel in it was of the categories that may be attacked without warning would be so strong that there would, in fact, appear to be no real objection to attacking it indiscriminately from either the legal or political standpoint.'[77]

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77. Ibid.

Such a situation would not require an elaborate scheme of announced danger areas and it was accepted that: 'If it is decided to adhere to the policy hitherto adopted, the question of declaring dangerous areas is of no great intrinsic importance.'[78] Certainly, existing policy allowed virtually indiscriminate attack on convoys if known to be proceeding to invade British territory. On other enemy convoys the view was that neutral shipping within them would have to run the risk of destruction as a result of an attack on the entire convoy. However, Admiralty policy seemed more concerned with, 'the necessity of initiating a policy of reprisal with clean hands,'[79] than with the practicality of the situation. 'Innocent ships in belligerent convoy may not be sunk without warning,' however, 'they incur the risk of being hit by gun or torpedo directed against the escort or guilty merchant vessel.'[80] Clearly no submarine would be able to surface in the face of an armed convoy escort to give a warning to individual ships in that convoy any more than it would be possible for a submarine commander to isolate one vessel in such a confused situation, both senior and operational officers being aware of these facts. In addition, existing legislation banning unrestricted submarine warfare allied to plans for the 'defensive' arming of British merchant ships were designed to nullify the power of the submarine by forcing it to operate in a vulnerable position on the surface. The final decision was to shelve the problem for the immediate future since, 'with regard to the proposal to notify dangerous areas, this can legally only be done by means of mines.'[81]

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78. ADM 1/10360, 'Attacks on Enemy Convoys.' (See Note 76.)

79. D. of P., 26 Aug. 1939, ADM 1/10360, 'Remarks on R.A.(S)'s Memorandum of 3 Aug.'

80. Ibid.

81. ADM 1/10360, D. of P. (See Note 79.)

Largely as a reaction to the failure of the 1935 London Conference attempts had been made to improve submarine numbers under the 1936 and 1937 programmes. However, the Admiralty yielded to Treasury pressure over the 1938 programme, resulting in a cutback to a replacement level. Political developments in Europe cut short any permanent reduction and intensive efforts were made to augment existing numbers. Irrespective of military or political requirements, however, there was a limit to the measures which could be taken quickly to rectify any shortage of matériel. These steps were hampered by a much reduced national shipbuilding capacity which directly resulted from the long years of retrenchment and neglect. In addition, there was the problem of construction time, for even with the most vigorous of armaments industries there existed a limit to the speed with which the end product could be produced - and the British armaments industry was not in vigorous shape. Thus, in 1935 while it had been calculated that there was a military requirement for a submarine force of 70,000 tons, the political, economic and constructional factors dictated an effective limit of 40,000 tons for the immediate future. Although additions were made to the later programmes, clearly no short term improvement was likely in numbers. Thus, submarines ordered in early 1939 could not be expected to enter service until late 1940. Therefore, for the first year of the war the Royal Navy would be faced with the prospect of relying on its existing submarine force, which would obviously be reduced by war losses, and the advent of the few boats ordered under the 1937 and 1938 programmes. Shortage of submarines proved so severe that during the early months of the war, until the 'T', 'S' and 'U' war orders could find their way into service,[82] that the old 'H' and 'L' class submarines had

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82. Admiralty, 28 Sept. 1939, ADM 167/105, 'War New Construction Programme - Submarines.'

to be brought into operational use. In addition several old 'R' and 'S' class boats were borrowed from the United States Navy to augment the training forces.

The deficiency in numbers proved an admission of the failure to react adequately to the steady deterioration of the political situation in both Europe and the Far East. Despite this, orders prior to the war still only equalled the exact number of over-age submarines up to 1939. Nevertheless, even such a limited response illustrated how unrealistic had been the Government's pre-1935 London Conference proposal for a submarine force of only 40 boats. Although factors such as shipbuilding capacity and construction time played an important part in ensuring a slow response to the international political situation after 1935, the problem of Government aversion to rearmament proved difficult to eradicate. Elsewhere the realisation was dominant that existing naval forces were inadequate in numbers and sometimes quality for the roles and commitments they would be expected to undertake. Shortage of numbers contributed again to the clear but belated realisation of the inadequacy of post-war British Government policies and the fatal acquiescence of the Admiralty at crucial periods.

Therefore, in the submarine category, although confirmation was given to a force total of approximately 70 boats, evidence accumulating in the final months of peace indicated that at least a further twenty submarines would be needed to accommodate initial war losses. Moreover, in ideal terms a force of twice the earlier figure was considered essential. Overall, the weakness in numbers of the British submarine force was also a reflection of the belief, based on investment in the battlefleet, that the submarine fulfilled only an auxiliary role in naval tactics. Similarly, certain aspects of naval thought rated the influence of maritime air power, real

and potential, far too low, until it was almost too late. Clearly, as long as control of the air and the undersea remained inadequate then Britain faced the danger of losing command of essential sea communications and trade routes.

CONCLUSION

The purpose of this thesis has been to describe and account for the development of British naval policy in relation to the submarine. The invention of the submarine in a practical form at the turn of the century presented naval designers with a difficult new technology to master and operators with a quandary. Official reluctance to adopt and then develop the new weapon meant that progress in producing reliable designs was slow. Partly because of the adoption of a policy which favoured the development of short-range coastal submarines the Royal Navy lagged behind Germany before 1914. Senior naval commanders still regarded the submarine as a slow, unreliable and vulnerable vessel which had to be accompanied by a surface warship on cruises outside coastal waters. Therefore, the ways in which submarines came to be operated during the war were an unsettling surprise and a challenge to traditional naval thinking and tactics. By 1918 research and development had pushed submarine surface speeds up to 24 knots (on steam turbines) and provided increased size, armament and endurance. The result was that the submarine had been developed to a high level of efficiency in a much shorter period absolutely as well as relatively than any other type of naval weapons-system. No similar claim could really be made in respect of the Naval Air Arm; the potential of maritime air power lay largely in the future and the development of naval aircraft proved slower than their land-based counterparts. Effective naval air power was recognised as requiring the replacement of seaplanes by aeroplanes and the provision of efficient aircraft carriers able to maintain station with the Fleet. In the case of the submarine a wide range of advances had already been made; in addition to the coastal and overseas patrol submarines, several other models had been produced including fleet, monitor and minelayer submarines. These were the result,

not only of the perceived needs of war, but of the general naval attitude towards the role of the submarine within the Royal Navy: to support the Fleet.

The public also expected fleet actions and overwhelming victories, which reflected the traditional presentation of naval history. The effect on naval training and tradition resulted in an emphasis on fleet battles to the detriment of control of sea communications and protection of merchant shipping. The former was vital to Imperial cohesion and the latter to national survival. Loss of control in either area created the spectre of defeat. Despite the evidence of history and of Jutland, that there was no such thing as a decisive fleet action which would end a war, the belief persisted. The Navy's strategy and tactics were reflected in the preoccupation with preparing for the next Jutland, even though technical developments increasingly precluded such an event. In addition, after 1918 the British were unlikely to be faced by any enemy fleet comparable with the German High Seas Fleet. If it was not yet fully clear how the submarine might revolutionise naval warfare it was obvious that it added to its uncertainty. But the result was a reinforcement of the belief that a decisive battle was necessary. Many senior officers refused to accept that any warship which could not take a place in surface fleet actions could be considered as anything other than an auxiliary: for many, the capital ship remained dominant because it was the only vessel which could force a decision in the fleet action which continued to be held as the ultimate reason for the Navy's existence. The Submarine Service reacted to this belief by attempting to adapt the submarine to a range of quasi-surface roles. The element of surprise given by submergence was recognised and encouraged; but, it was also nullified by the Navy's emphasis on surface engagement. This emphasis cannot be fully explained, but undoubtedly had something to do, in pre-Asdic days, with the sense of helplessness

on the part of surface warship captains as long as the submarine remained an undetectable threat: the same sense of disquiet that led to continuing hopes, after the war, that the submarine could be abolished.

Yet, conversely, British submarine development had flourished in the wartime period. The élan of many submarine commanders and their successes stimulated a general desire to match the German efforts to develop this new weapon and produced, by the end of the war, a large submarine force, with a wide range of capabilities, and skills in operations and matériel which gave a sizeable lead over States which, unlike Germany, retained submarines in their navies. It also produced a body of skilful, but frequently very young submarine officers who, for all their enthusiasm, were not senior enough to influence doctrinal thinking about the new weapon in the post-war international system. Demobilisation and retrenchment reduced the submarine force, and made the survivors subject to the results of disarmament negotiations. Failure to secure agreement either on the total abolition of the submarine or a limited possession of the submarine by the other major naval Powers ensured its retention in the Royal Navy even though, intrinsically, it represented more of a threat to British maritime interests than any other recent developments.

In terms of technical advance so much had been done by 1918 that the main lines of submarine development had already been fixed. Therefore from 1918 to 1939 matériel advances were incremental and there were no startling developments which would have forced the Royal Navy to pay particular attention to the submarine. Nothing took place on a scale comparable to the development of marine nuclear technology in the 1950's which so altered submarine capability. Moreover, many of the ideas which had emerged by 1918 which had been thought to be interesting or promising turned out to be neither. Patrol submarines had demonstrated their utility and therefore the limited submarine construction resources available were

concentrated primarily on this model; so were the roles that were allocated to the Submarine Service. The most successful of these had been reconnaissance, and little priority was attached to commerce attacks, because of the absence of any potential enemy with a large merchant fleet, and because the cruiser force was considered capable of dealing more successfully with enemy merchant shipping, by engagement during the opening stages of a war and then by distant blockade.

The steady decrease in submarine construction resulted in an increasingly limited number of submarines and no possibility of extensive progress in producing improvements. Moreover, despite the relative priority accorded to the patrol model it was not until November 1923 that the first post-war design was ordered. The future development of fleet and cruiser submarines was subject to technical and tactical as well as political and economic conditions. Nevertheless, there continued to exist a strong belief in the necessity for fleet submarines as an adjunct to the battle-fleet. In this scenario, engendered partly by the "sunk cost" investment in capital ships, the submarine continued to be regarded as fulfilling an auxiliary role. Even the critical views expressed by the Naval Staff that the fleet submarine was not an essential unit of the Fleet were not occasioned by the desire to develop more promising roles for the submarine but rather to prevent expenditure. If any emphasis had been placed on promoting the submarine in roles more suited to the existing level of technological development it is difficult to avoid the conclusion that it would have led to a more rapid appreciation within the Navy of the distinctive contribution the submarine could make to naval warfare, which had to be based upon its invisibility when submerged.

Many of the experiments with specialist types of submarine in the Royal Navy stemmed from the belief or knowledge that similar work was being undertaken by other navies, sometimes on flimsy evidence. Although

there was a basic determination among the naval construction and design teams to stay abreast of the latest submarine developments, these were always subject to the limitations of finance and the greater priority awarded to other categories of warships. Thus, submarine weapons development, for example, was squeezed: even marginal improvements in torpedoes took up to a decade and very little was achieved. Moreover, the bulk of the cost of research and development, including Asdic and W/T for submarines was borne by other sectors of the Royal Navy. Submarines in this regard tended to be the same sort of Cinderella that the Naval Air Arm was in aircraft development. Nevertheless, development of hull design and propulsion systems did take place, resulting in submarines which although only marginally faster than boats of 1914-1918, possessed greater endurance, larger torpedo armament, a deeper diving ability, and greater overall reliability. However, the submarine remained primarily a submersible vessel operating most of the time on the surface and submerging only to evade an attacking warship or aircraft, or to launch a torpedo attack. The dual propulsion system of diesels on the surface and electric motors submerged remained unchanged throughout the period. The limitations of existing diesel propulsion resulted in a gradual acceptance that increases in surface speed could only be gained by increasing the size of the engines which in turn required an increase in the size of the submarine; but the greater displacement ensured only a minor gain in speed, and the larger the submarine became, the more unstable and unmanoeuvrable it was underwater. By the late 1920's development came to concentrate on increased endurance and reliability. An obvious solution was to increase the amount of fuel oil carried but the restricted space available within the pressure hull required the use of part of the ballast tanks for storage. These were constructed from weaker materials than the pressure hull and until the advent of advanced welding techniques during the Second World War,

British submarines suffered from leakages of fuel oil while submerged. This required a partial reversion to fuel oil storage within the pressure hull but international tonnage limitation agreements in force by the 1930's meant that new designs were severely limited in the amount of extra fuel which could be stored. Continuous development and improvement in hull construction techniques, largely based on the desire to increase diving depth, resulted in some improvement to the leakage problem.

In terms of naval policy, retention of the British submarine led to the decision that the numbers required would not be based on the total of submarines possessed by other nations but rather on the potential threat posed by the strongest possible opponent in European waters (France) and in the Far East (Japan). The existing and projected strength of the British battlefleet precluded the basing of sufficiently powerful naval forces simultaneously in Europe and the Far East, and to move the main Fleet to the Far East would take at least several weeks. The Naval Staff, despite the evidence of the First World War, considered that submarines might be useful in local defence in the Far East and for rear-guard actions until major surface units could arrive in the area. This reasoning was based partly on the relatively low cost of submarines but more decisively on the probable shortfall in more suitable surface warships, such as the cruiser, as these were also subjected to limitation agreements. Nevertheless, although lacking adaptability for peacetime diplomacy and public relations duties, the submarine was accepted as possessing a credible wartime capability. Moreover, the official attitude for over two decades had been that the submarine was the ideal weapon for the Power in the weaker position or on the defensive; in support, the Naval Staff could point to the French acquisition of large numbers of submarines. British policy was therefore always to station in the Far East the largest patrol submarines available: but these boats were usually inadequate in size and endurance for the roles

assigned to them. By the time designs for the next generation of patrol models were finalised in the early 1930's the effects of further disarmament conferences and tonnage limitation agreements resulted in boats with size and endurance more suitable for European waters, and the Far East remained an area for which no role-designed submarines were provided until 1944.

Overall, by the 1930's, the Admiralty considered warships the main target for British submarines, although some attention was given to surface shadowing of enemy troop convoys, and reconnaissance remained one of the most firmly advocated duties. The surface shadowing role reflected a continuing preoccupation with attempts to use the submarine as a substitute surface warship. The need to use the limited tonnage available in the submerged roles of reconnaissance in enemy waters and warship attacks resulted eventually in the deletion of 'substitute' roles. However, the question of submarines roles had a minimal effect in the early 1930's on the Admiralty's assessment of numbers and tonnage limitation agreements. Not until 1936 did the annual submarine construction rate even match the number of boats annually reaching the over-age limit or being scrapped; yearly the Admiralty had to prune its construction requirements, in which the submarine continued to have a low priority. Throughout the period between the two World Wars, while the battleship was limited by a building 'holiday', the cruiser and the destroyer were considered of prime importance and the official attitude remained that the submarine was retained principally because other Powers could not be persuaded to renounce it. The deterioration of the international situation only very gradually altered this policy.

Requirements for submarine types had already changed but to a certain extent the developments had cancelled each other out. Increases in the size of new submarines caused a rise in the cost of individual boats and, in the atmosphere created by shortage of hulls and continuing financial

restrictions, the emphasis was diverted to meeting the overall tonnage quota with a greater number of smaller submarines. Even then the low level of proposed submarine strength necessitated a highly optimistic view being taken of the potential wartime strain that the British submarine force was likely to undergo. The calculations involved the assumption that, for planning purposes, war would occur only in one area (Europe or the Far East) at any time. Even then the projected force level could only be considered sufficient by ignoring the effect of early war losses.

Circumstances eventually dispersed these erroneous proposals. The Admiralty gradually recognised that there would be a irreversible decline in the proportionate strength of the Royal Navy unless Britain made a major effort to match the building programmes of the other naval Powers. The case had been set out during 1934 in the 'New Standard of Naval Strength' and the failure of the 1935 London Conference forced the Government to concede that there was now an urgent need to rectify the deficiencies in the Navy's strength. However, major short term problems now included not only money, but the limited capacity of British shipbuilding. Only three firms remained capable of constructing submarines and all of them needed financial assistance and time to improve their facilities before any new orders could be laid down.

Meanwhile, the increasing possibility of a simultaneous war in Europe and the Far East posed insoluble problems for naval planners. The low strength of the British submarine force and the need for submarines to be stationed in Home waters and the Mediterranean now meant that the requisite number of submarines could not be sent to the Far East, either for a 'holding' action until the arrival of the Main Fleet or for reconnaissance and local defence roles. No thought appears to have been given to using submarines in an anti-commerce role once it was accepted that Hong Kong was likely to be an initial and vulnerable target. The distance from

Singapore to Japanese waters, the shortage of submarines, and the greater importance attached to defensive roles, combined to ensure that any concept of attacking the Japanese merchant marine was not followed up. The Americans were to prove the value of such a campaign during the Second World War and during the early years of that conflict proved that distance was no permanent obstacle by operating from Australia and Hawaii. However, the Americans possessed the advantage of having pursued a consistent policy of developing long-range submarines, since an ocean-war with Japan was always a prime contingency in their Exercises and War Plans. For the British, the disposition of submarines for a war with Germany proved more difficult to define since there was no High Seas Fleet upon which to focus and the utility of the French as a surrogate-adversary fell quickly away in tactical planning; but the final decision was to repeat the dispositions and roles of the First World War.

Overall, the failure to maintain a realistic level of naval strength in the inter-war period in all categories, had become alarmingly clear in 1938 and, for submarines, the new 'ideal' force total was calculated in that year to be as high as 127 boats. This was twice the total the Royal Navy had on the outbreak of war in September 1939. The weakness of the submarine force at that time lay principally in the numbers of hulls available in relation to what was required of them: the matériel proved, in general, to be sufficiently good to get by.

Throughout the inter-war period, while substantive naval doctrine still regarded the battlefleet and the surface warship in general as the principal arbiters of naval warfare, the threat and potential of the submarine was underplayed. During the 1920's the Navy generally suffered a period of tactical sterility, stemming from a preoccupation with the past rather than an awareness of future needs, and from a requirement to save on fuel and ammunition. How far financial stringency was an excuse rather

than an explanation is not clear. The shortage of submarine hulls was to be a critical tactical issue, but in strategic terms the neglect to provide adequate numbers of major warships was to prove a far more serious consequence of the attitude to defence procurement during the inter-war period. A persistent desire for disarmament even when it was shown to be internationally unattainable marked the political climate of the period. Government policy favoured arms reduction for financial as well as moral reasons but the dependent trust put up on international agreements was not followed up by any consistent policy towards either the international requirements of the 'collective security' which had been hoped for from the League of Nations nor effective internal economic allocation of resources. The 'Ten Year Rule' was a self-denying ordinance that reflected a set of domestic aspirations more than it did a cohesive determination to ensure that home and overseas policies marched in step. Thus, Government policy in the 1920's, on international disarmament had continued to press for submarine abolition: the official climate, despite Beatty's objections, remained unfavourable towards both development and expansion of submarine numbers. The Admiralty rightly became sceptical on the possibility of achieving abolition in the face of increasing foreign opposition, but hoped that tonnage reductions might be secured which would allow financial savings by reducing the need for future A/S forces. Meanwhile, until submarine abolition or limitation became a fact, the Admiralty had still to wrestle with the problem of inadequate numbers. Reductions in existing flotillas, curtailment of new construction and continuation of the existing scrapping proposals meant that the Admiralty was forced cumulatively to revise its submarine policy downward to conform with the Government's financial views.

Financial pressures were important in the Depression but political pressure was dominant, as was indicated by the decision to suspend the

1929 and 1930 submarine programmes pending the results of the 1930 London Naval Conference. During the late twenties and early thirties the Admiralty seems to have been dominated by a lethargy towards the disarmament policies of the Government of the day which it found difficult to overcome in the period when Beatty's dominant hand had been removed. The acquiescence of the Board in the reductions and deferments of the period can be mostly explained by the constant pressure for economy to which they were subjected by successive Governments. The familiar pattern from the early years of the 1920's centred on the Board of Admiralty's main efforts being engaged in the yearly battle over the Navy Estimates. In addition, long periods of tradition and success were logically breeders of conservatism and suspicion of fundamental change. Liddell Hart said that the only thing more difficult than getting a new idea into a soldier's head was getting an old one out; but he, or Sir Herbert Richmond, might have said it of sailors, too. Clearly, what would have been required was a reversal of the economic and structural factors, as well as a quite exceptional bid for extra Governmental political support to maintain a higher level of investment in the Fleet; this would not only have been difficult to achieve in the absence of any external threat as pressing as Tirpitz's Navy had been in 1908, but it would probably have called for Army and Air Force concurrence, if not active support. The prospects for this were low, and the general political atmosphere unfavourable. Public attitudes towards the Navy were not what they used to be, especially after Invergordon. Only the collapse of the disarmament policies in the ruins of the 1935 London Naval Conference ensured political acceptance, if not recognition, of the need for extensive new construction to repair the deficiencies in the Fleet.

In 1936, for the first time, annual submarine construction rate rose above three boats. However, by that stage the final shortage - time - had

been added. Between 1936 and 1938 the Admiralty also ordered five battleships, four aircraft carriers and 21 cruisers but only nine A/S or escort vessels. A freedom to build beyond the prior treaty limitations and the belief in the continuing dominance of the Fleet action were the basis of this decision. Yet, although the Admiralty knew that the Germans were building a few technically advanced capital ships they could not but also be aware that they had officially sanctioned the resurgence of the U-boat arm under the 1935 Anglo-German Naval Agreement.

The threat posed by foreign Powers' possession of the submarine had been illustrated by the effect on the unrestricted submarine campaign of 1917 against British and allied merchant shipping. Submarines had also had such a restrictive influence on the battlefleet that a large number of destroyers to screen the fleet had been considered necessary before it was safe for the capital ships to put to sea. During most of the First World War destroyers had not possessed any detection devices, which restricted their effectiveness against the U-boats, but nevertheless, destroyers often forced the submarine to launch its torpedoes at sufficient distance to allow the attacked vessel to take avoiding action. In addition, the presence of destroyers resulted in submarines being forced to dive and abandon an attack. Nevertheless, the protection afforded to the Grand Fleet was bought by force of numbers that resulted often in an inadequate level of defence for the merchant convoys.

In 1917 successful experiments had resulted in the first crude Asdic devices. The initial successes achieved with this equipment led to the belief that this device would provide the answer to any future submarine threat. Further developments of this locating device had been kept secret even from Britain's wartime allies. Evidence suggests that the secret was well kept and that in 1939 Britain held a definite lead in Asdic development. Not only did other nations lack equipment of sufficient quality to

pose a serious threat to British submarines but rumours concerning the effectiveness of Asdic magnified its actual effectiveness. Nevertheless, the prime motive behind the development of Asdic continued to be that of providing a means for surface vessels to defeat the submarine. Despite intense and relatively expensive development undertaken throughout the inter-war period, the effectiveness of Asdic continued to be limited by weather, and the wide range of sea conditions inherent in open waters. Advances in detection range, although limited, were made and the speed at which A/S vessels could operate was raised. In 1939 British A/S forces possessed a far more effective weapon than in 1918; but it was still no full answer to submarine operations. The principal deficiency was in the failure to provide an adequate number of A/S vessels to carry the equipment, despite the warnings given by Naval Staff studies and naval spokesmen from the early 1930's onwards. Faced with the continuous problem of procuring resources to produce the number of A/S vessels which might be needed, many senior naval officers tended to find comfort in an exaggerated and rationalised belief that Asdic would provide a total solution to any threat posed by foreign submarine forces. Allied to this was an attitude of indifference towards convoy during much of the inter-war period. Many senior commanders had an antipathy towards convoy, regarding it as a defensive measure and therefore anathema to a service whose greatness was believed to lie in its readiness to assume the offensive. There was, at the very least, little recognition of the immensity of the problem that would be occasioned by a general introduction of the convoy system. Existing numbers of A/S vessels might be adequate for defence of the Fleet but the additional need to cover merchant convoys presented an impossible task. The collapse in 1936 of the disarmament policies which had been pursued for over a decade, and the growing belligerence of Germany and Japan, finally persuaded the political and naval authorities to grapple with this problem. However, by

then time was too short for even great amounts of money to provide a solution until well into the Second World War, and expedients of various kinds had to be resorted to.

In addition to the twin problems of finance and international arms agreements affecting the amount of resources allocated to the submarine, there was a third factor - the position of the Submarine Service within the Navy. The proponents of the submarine realised that with the return of peace the Government and Admiralty no longer felt such a concern for the submarine as an element in the Navy that they would see any major objection to disposing of submarines in an international agreement. In that sense the Submarine Service was in a weak and defensive position in the Navy. There was nothing in the functions of the Submarine Service as far as the Royal Navy was concerned which could enable it to bring strong pressure on the Admiralty for a larger and unfairly generous share of resources. Their needs were not considered serious enough to bring submarines to the centre of naval policy and there was no major problem over the allocation of resources to submarines, in contrast to the question of money for battleships or aircraft carriers that arose in the late 1930's.

Although the Submarine Service could reasonably point to the submarine's potential it was badly placed to make its voice heard, especially in terms of its strength as a sub-group of the naval officer corps. Most of the officers on submarines were of junior rank and few senior commands existed. To become successful meant leaving the submarine world. This contrasted with the other specialist arm created as a result of technological development - the Fleet Air Arm, which not only offered more senior posts for captains and commanders but was a constant preoccupation to the Board until the struggle to regain total control from the R.A.F. had been won. Moreover, officers who joined either the Submarine Service or the Fleet Air Arm tended to be regarded as deviant enthusiasts. What was beyond doubt

was that the most formative period of an officer's career was as a ship's officer: his ideas were formed then rather than as a senior commander. The majority of posts being surface ship appointments, the consequence was a senior officer corps which knew about cruisers, for example, but was relatively ignorant of submarines. Opinions were therefore unreceptive to such Submarine Service pressure as existed and personal views based on operational experience were self-reinforcing. Chatfield who, as the heir of Beatty, saw his role as restoring the confidence of the Navy in Whitehall after a number of difficult transitional years is an example. Although his papers contain extensive reference to surface ships in general and especially cruisers, including the necessity of maintaining an adequate number and avoiding a shortfall in construction programmes, no evidence exists of an interest in the submarine. In the 1920's and 1930's there were many officers in senior positions who still did not really understand the submarine. In operational terms the Submarine Service was again in a similar position to the Fleet Air Arm, new and thus in some ways exciting; but different and therefore in other ways difficult to come to grips with. Thus, in 1939 much criticism could be, and was, fairly directed at the unskilful and uninformed use of both submarines and aircraft carriers. That there was some justification in such criticism could be seen in the fate of H.M.S. 'Courageous', torpedoed while on A/S patrol.

From a First Sea Lord's viewpoint, submarines had a limited utility in peacetime. Unlike cruisers or capital ships they could not easily be used for either 'cold war' or 'gunboat diplomacy'. These had more evident utility in wartime operations and it made military sense to send submarines to the Far East, even though it was primarily a defensive gesture. In terms of priority for constructional resources the submarine possessed some advantages in military capabilities per pound spent but not sufficient marginal utility to justify constructional preference over other categories,

especially in peace as well as war. Under the effects of the 'Ten Year Rule' the Admiralty had to consider not only military functions but also a vessel's capabilities in peacetime activities. In this either or situation the decision tended to favour the surface vessel, such as the destroyer, over the submarine.

Two other major problems had had to be faced and overcome by the Submarine Service's persistence. For a long time the international political environment favoured attempts to reach agreement on arms limitation. The strong thread that ran through this expectation was that some at least of the weapons of the First World War could be abolished. Submarines and poison gas were two particular types of weapon which had a special concern for the British - gas for its horror and submarines because of their particular threat. In this context, Government aspirations were in some sense a reflection of a sector at least of public opinion, which, together with the effect of direct economic pressure, affected Government policy towards providing resources for the Services. In economic terms this was not only a period of chronic instability, culminating in the worst slump in British economic history, but also the era of pre-Keynesian economics. Deficit budgeting was anathema; balancing of the budget must be done on a year to year basis, and cuts were arbitrary and based on political expediency rather than on any relationship to investment rationale. Not only was there a general Service worry about the continuing decline in the defence budget but also a primary point of concern, the share that each of the Services received. Whatever the individual problems, Governments' overall policy remained firm for a long time in the belief that it was not economically orthodox to use public expenditure to stimulate armaments or engineering production to maintain employment or indeed to use public works of any kind in this way. Certainly, as far as the Services were concerned, the Government felt committed for a very long time to retain something of

the aspiration that had been prevalent in 1918 - that the Great War had been the war to end wars.

However, despite overcoming many of the problems which faced it, or perhaps because of those which it failed to solve, the Submarine Service could feel in the final assessment, that it had achieved neither the prestige nor the influence in the inter-war period, which were commensurate with any sympathetic view of the importance of its functions. In 1939 the other new branch, the Fleet Air Arm, was represented on the Board of Admiralty by the Fifth Sea Lord while the Submarine Service had no representative on the Naval Staff at anything like the same level. There is little evidence however that this particular disability worried the Flag Officers, Submarines; the Submarine Service tended to regard itself as a 'private navy' and inevitably was treated as such by the other specialist branches. Flag Officer Submarines was king in 'Dolphin', and this gave cohesion to the Branch even if it did not spread the submarine gospel very fast or far. It produced, amongst other benefits, a host of able submarine commanders in the Second World War, but it delayed the integration of the Submarine Service into the mainstream of naval doctrine. It was perhaps only the ultimate paradox that the first Submarine specialist to become First Sea Lord and Chief of Naval Staff resigned because aircraft carriers could no longer be afforded in the Fleet.

A P P E N D I C E S

APPENDIX: A OFFICE HOLDERS

A(1) HEADS OF THE SUBMARINE SERVICE

COMMODORE(S) AND REAR ADMIRAL(S)

Feb. 1915 - 24 Aug. 1919	Commodore S. S. Hall
25 Aug. 1919 - 24 Aug. 1921	Rear-Admiral D. L. Dent
25 Aug. 1921 - 31 Aug. 1923	Rear-Admiral H. F. P. Sinclair
1 Sep. 1923 - 31 Aug. 1925	Rear-Admiral W. S. Nicholson
1 Sep. 1925 - 31 Aug. 1927	Rear-Admiral V. H. S. Haggard
1 Sep. 1927 - 1 Sep. 1929	Rear-Admiral H. E. Grace
2 Sep. 1929 - 1 Sep. 1931	Rear-Admiral M. E. Dunbar-Nasmith, V.C.
2 Sep. 1931 - 9 Dec. 1932	Rear-Admiral C. J. C. Little
10 Dec. 1932 - 9 Dec. 1934	Rear-Admiral N. F. Lawrence, D.S.O.
10 Dec. 1934 - 9 Dec. 1936	Rear-Admiral C. P. Talbot, D.S.O.
10 Dec. 1936 - 14 Dec. 1938	Rear-Admiral R. H. T. Raikes, D.S.O.
15 Dec. 1938 - 3 Jan. 1940	Rear-Admiral B. C. Watson

A(2) FIRST LORDS OF THE ADMIRALTY

20 Jul. 1917 - 16 Jan. 1919	Sir Eric C. Geddes
16 Jan. 1919 - 18 Feb. 1921	Walter H. Long
	(Viscount Long, 1921)
18 Feb. 1921 - 31 Oct. 1922	Arthur Hamilton, Baron Lee
31 Oct. 1922 - 28 Jan. 1924	Leopold C. M. S. Amery
28 Jan. 1924 - 7 Nov. 1924	Frederick J. N. Thesiger
	(Viscount Chelmsford)
7 Nov. 1924 - 10 June 1929	William C. Bridgeman
	(Viscount Bridgeman, 1929)
10 June 1929 - 27 Aug. 1931	Albert V. Alexander
	(Viscount, 1950; Earl, 1963)
27 Aug. 1931 - 9 Nov. 1931	Sir Joseph A. Chamberlain
9 Nov. 1931 - 6 June 1936	Sir Bolton M. Eyres-Monsell
	(Viscount Monsell, 1935)
6 June 1936 - 28 May 1937	Sir Samuel J. G. Hoare
	(Viscount Templewood, 1944)
28 May 1937 - 27 Oct. 1938	Alfred Duff Cooper
	(Viscount Norwich, 1952)
27 Oct. 1938 - 3 Sep. 1939	Earl Stanhope

A(3)

FIRST SEA LORDS AND C.N.S.

27 Dec. 1917 - 1 Nov. 1919	Acting-Admiral Sir Rosslyn E. Wemyss	
1 Nov. 1919 - 30 Jul. 1927	Admiral of the Fleet Earl Beatty	
30 Jul. 1927 - 30 Jul. 1930	Admiral of the Fleet Sir Charles E. Madden	
30 Jul. 1930 - 21 Jan. 1933	Admiral Sir Frederick L. Field	
21 Jan. 1933 - 17 Nov. 1938	Admiral Sir A. Ernle Chatfield	
17 Nov. 1938 - 15 June 1939	Admiral Sir Roger R. C. Backhouse	
15 June 1939 - 15 Oct. 1943	Admiral Sir A. Dudley P. R. Pound	

A(4) SECOND SEA LORDS

27 Sep. 1917 - 31 Mar. 1919	Vice-Admiral Sir Herbert L. Heath
31 Mar. 1919 - 30 Sep. 1920	Vice-Admiral Sir Montague E. Browning
30 Sep. 1920 - 15 Aug. 1924	Vice-Admiral Sir Henry F. Oliver
15 Aug. 1924 - 2 Apr. 1925(Died).. ..	Vice-Admiral Sir Michael Culme-Seymour, Bart.
22 Apr. 1925 - 15 Aug. 1927	Vice-Admiral the Hon. Sir Hubert G. Brand
15 Aug. 1927 - 26 May 1930	Vice-Admiral Sir Michael H. Hodges
26 May 1930 - 31 Aug. 1932	Admiral Sir Cyril T. M. Fuller
31 Aug. 1932 - 30 Sep. 1935	Vice-Admiral A. Dudley P. R. Pound
30 Sep. 1935 - 30 Sep. 1938	Vice-Admiral Sir Martin Dunbar-Nasmith
30 Sep. 1938 - 1 June 1941	Admiral Sir Charles J. C. Little

A(5)

THIRD SEA LORDS AND CONTROLLERS

17 June 1918 - 2 July 1919	Captain	Charles M. de Bartolomé.
2 July 1919 - 15 Apr. 1920	Rear-Admiral	Sir William C. M. Nicholson
15 Apr. 1920 - 15 May 1923	Rear-Admiral	Frederick L. Field
15 May 1923 - 30 Apr. 1925	Rear-Admiral	Cyril T. M. Fuller
30 Apr. 1925 - 1 Nov. 1928	Rear-Admiral	Sir A. Ernle Chatfield
1 Nov. 1928 - 1 Mar. 1932	Rear-Admiral	Roger R. C. Backhouse
1 Mar. 1932 - 23 Apr. 1934	Rear-Admiral	Charles M. Forbes
23 Apr. 1934 - 1 Mar. 1939	Vice-Admiral	Reginald G. H. Henderson
1 Mar. 1939 - 22 May 1942	Rear-Admiral	Bruce A. Frazer

A(6) DEPUTY CHIEFS OF NAVAL STAFF

10 Jan. 1918	1 May 1919	.. .. ..	Vice-Admiral Sir Sydney R. Fremantle
1 May 1919	4 Aug. 1919	.. .. ..	Rear-Admiral James A. Ferguson
4 Aug. 1919	1 Nov. 1921	.. .. ..	Vice-Admiral Sir Osmond de B. Brock
1 Nov. 1921	15 May 1925	.. .. ..	Vice-Admiral Sir Roger J. B. Keyes
15 May 1925	1 May 1928	.. .. ..	Vice-Admiral Sir Frederick L. Field
1 May 1928	30 June 1930	.. .. ..	Vice-Admiral William W. Fisher
30 June 1930	9 Jan. 1933	.. .. ..	Vice-Admiral Frederic C. Dreyer
9 Jan. 1933	29 Oct. 1935	.. .. ..	Vice-Admiral Charles J.C. Little
29 Oct. 1935	14 Nov. 1938	.. .. ..	Vice-Admiral William M. James
14 Nov. 1938	1 June 1939	.. .. ..	Rear-Admiral Andrew B. Cunningham
1 June 1939	21 Oct. 1941	.. .. ..	Rear-Admiral T. S. V. Phillips

PERMANENT SECRETARIES OF THE ADMIRALTY

(Became a full member of Board of Admiralty 31 Oct. 1921)

1911	7 Aug. 1917	.. .. ..	Sir W. Graham Greene
7 Aug. 1917	10 July 1936	.. .. ..	Sir Oswyn A. R. Murray
10 July 1936	5 Dec. 1940	.. .. ..	Sir R. H. Archibald Carter

A(7) COMMANDERS IN CHIEF GRAND, ATLANTIC AND HOME FLEETS

29 Nov. 1916 - 7 Apr. 1919	Admiral Sir David Beatty
(Grand Fleet)	(Earl, 1919)
8 Apr. 1919 - 14 Aug. 1922	Admiral Sir Charles E. Madden
(Atlantic Fleet - Dec. 1919)	
15 Aug. 1922 - 14 Aug. 1924	Admiral Sir John M. de Robeck
15 Aug. 1924 - 14 Aug. 1927	Admiral Sir Henry F. Oliver
15 Aug. 1927 - 16 Apr. 1929	Admiral the Hon. Sir Hubert G. Brand
17 Apr. 1929 - 25 May 1930	Admiral Sir A. Ernle Chatfield
26 May 1930 - 5 Oct. 1931	Admiral Sir Michael H. Hodges
6 Oct. 1931 - 13 Sep. 1933	Admiral Sir John D. Kelly
(Home Fleet - March 1932)	
14 Sep. 1933 - 19 Aug. 1935	Admiral Sir William H. D. Boyle (Earl of Cork & Orrey, 1934)
20 Aug. 1935 - 11 Apr. 1938	Admiral Sir Roger R. C. Backhouse
12 Apr. 1938 - 1 Dec. 1940	Admiral Sir Charles M. Forbes

A(8) COMMANDERS IN CHIEF MEDITERRANEAN FLEET

26 Aug. 1917 - 25 July 1919	Admiral Hon. Sir Somerset A. Gough-Calthorpe
26 July 1919 - 14 May 1922	Admiral Sir John M. de Robeck
15 May 1922 - 7 June 1925	Admiral Sir Osmond de B. Brock
8 June 1925 - 7 June 1928	Admiral Sir Roger J. B. Keyes, Bart
8 June 1928 - 26 May 1930	Admiral Sir Frederick L. Field
27 May 1930 - 30 Oct. 1932	Admiral Sir A. Ernle Chatfield
31 Oct. 1932 - 19 Mar. 1936	Admiral Sir William W. Fisher
20 Mar. 1936 - 5 June 1939	Admiral Sir A. Dudley P. R. Pound
6 June 1939 - 1 Apr. 1942	Admiral Sir Andrew B. Cunningham

APPENDIX B:

B(1) BRITISH SUBMARINE BUILDING PROGRAMMES 1920 - 39

1921 Estimates: 'X.1'.

1923 Estimates: 'O.1' ('Oberon'). +

1926 Estimates: Six 'O' Class.

1927 Estimates: Six 'P' Class.

1928 Estimates: Four 'R' Class. x

1929 Estimates: One 'River' ('G') Class, two 'S' Class. *

1930 Estimates: One 'Porpoise' Class, two 'S' Class. i

1931 Estimates: One 'River' Class, two 'S' Class.

1932 Estimates: One 'River' Class, two 'S' Class. ii

1933 Estimates: Two 'Porpoise' Class, two 'S' Class.

1934 Estimates: One 'Porpoise' Class, two 'S' Class.

1935 Estimates: One 'Porpoise' Class, one 'S' Class, one 'T' Class.

1936 Estimates: One 'Porpoise' Class, four 'T' Class, three 'U' Class.

1937 Estimates: Seven 'T' Class.

1938 Estimates: Three 'T' Class.

1939 Estimates & Supplementary Estimates: Seven 'T' Class, five 'S' Class, twelve 'U' Class. iii

\+ Plus 'A.O.1' & 'A.O.2' for the Royal Australian Navy.

x Two 'R' Class were cancelled.

* Three 'G' Class were deleted from the Estimates.

i One 'G' Class postponed until 1931 Estimates, one 'Porpoise' Class included.

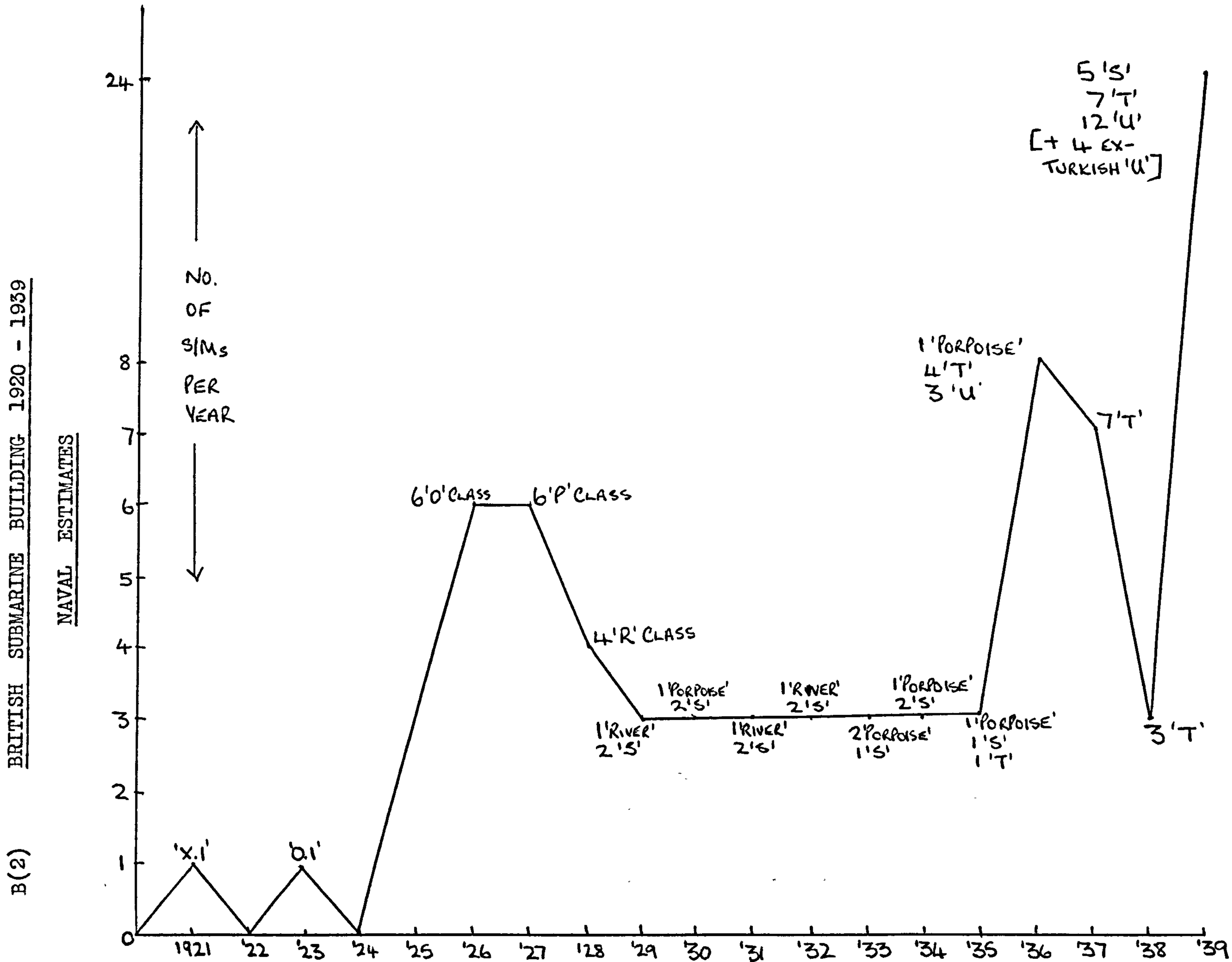
ii One 'Porpoise' Class deferred for a year and one 'S' Class brought forward.

iii Plus four ex-Turkish acquired.

B(2)

BRITISH SUBMARINE BUILDING 1920 - 1939

NAVAL ESTIMATES



B(3) BRITISH SUBMARINE BUILDING 1920 - 1939*

DETAILS OF SUBMARINE CLASSES

TITLE	DESCRIPTION	TONNAGE
'X.1'	Experimental Cruiser submarine	2,425
'O.1'	Patrol submarine	1,311
'O' Class	Patrol submarines	1,475
'P' Class	Patrol submarines	1,475
'R' Class	Patrol submarines	1,475
'RIVER' Class	Fleet submarines	1,850
'PORPOISE' Class	Minelayer submarines	1,520
'S' Class	Small Patrol submarines	640
'T' Class	Patrol submarines	1,090
'U' Class	Small Patrol submarines	540

* Six 'L' Class were transferred to H.M. Dockyards for delayed completion between 1923-26.

APPENDIX C:

BRITISH NAVY ESTIMATES AND ACTUAL EXPENDITURE

1919 - 1939

YEAR	NET ESTIMATES (in thousand pounds)	NET EXPENDITURE (in thousand pounds)
1918-19	149,200	334,091
1919-20	157,529	154,084
1920-21	84,372	92,505
1921-22	82,479	75,896
1922-23	64,884	57,492
1923-24	58,000	54,064
1924-25	55,800	55,694
1925-26	60,500	60,005
1926-27	58,100	57,143
1927-28	58,000	58,123
1928-29	57,300	57,139
1929-30	55,865	55,988
1930-31	51,739	52,274
1931-32	51,605	51,015
1932-33	50,476	50,164
1933-34	53,570	53,444
1934-35	56,550	56,616
1935-36	60,050	64,888
1936-37	69,930	80,976
1937-38	78,065	78,259
1938-39	93,707	96,396
1939-40	63,399	99,429

APPENDIX D: BRITISH SUBMARINE CLASSES 1900 - 1918

'Holland' to 'U' Class

D(1)
'Holland'

No.	Builder	Launched	Completed
1	Vickers	Oct. 1901	Feb. 1903
2	"	Feb. 1902	Aug. 1902
3	"	May 1902	Aug. 1902
4	"	May 1902	Feb. 1903
5	"	June 1902	Feb. 1903

(All were ordered in Dec. 1900 and built at Barrow-in-Furness)

Length $63\frac{1}{4}$ feet

Beam $11\frac{3}{4}$ feet

Displacement

Surface 105 tons

submerged 150 tons (No. 1 - 122 tons)

Engine Petrol

Screw 1

Performance

Surface 250 B.H.P. $8\frac{1}{2}$ knots (No.1 - 160 B.H.P.)

Submerged 74 S.H.P. 7 knots

Hull Single

Armament One 18 inch Bow T.T.

Complement Two Officers, seven ratings.

(These boats were originally designed without a periscope).

D(2)

'A' Class (All built at Barrow-in-Furness)

No.	Builder	Ordered	Launched	Completed
1	Vickers	Dec. 1900	July 1902	July 1903
2	"	Oct. 1902	Apr. 1903	July 1904
3	"	"	May 1903	"
4	"	"	June 1903	"
5	"	Aug. 1903	Mar. 1904	Feb. 1905
6	"	"	"	Mar. 1905
7	"	"	Jan. 1905	Apr. 1905
8	"	"	"	May 1905
9	"	"	Feb. 1905	"
10	"	"	"	June 1905
11	"	"	Mar. 1905	July 1905
12	"	"	"	Sep. 1905
13	"	"	Apr. 1905	June 1905

Length 105 feet (A.5-13 - 99 feet)

Beam $11\frac{1}{2}$ feet (A.5-13 - $12\frac{3}{4}$ feet)

Displacement

Surface 165 tons (A.5-13 - 190 tons)

Submerged 180 tons (A.5-13 - 205 tons)

Engine Petrol 12 Cylinder (A.5-13 - 16 cylinder)

Screw 1

Performance

Surface 450 B.H.P. 10 knots (A.5-13 - 550 B.H.P. $11\frac{1}{2}$ knots)

Submerged 80 S.H.P. $4\frac{1}{2}$ knots (A.5-13 - 150 S.H.P. 7 knots)

Endurance 320 miles at 10 knots

Hull Single

Armament Two 18 inch Bow T.T.

Complement Two Officers, nine Ratings.

D(3)

'B' Class (All built at Barrow by Vickers)

No.	Ordered	Launched	Completed
1	Mar. 1904	Oct. 1904	Apr. 1905
2	Jan. 1905	Aug. 1905	Dec. 1905
3	"	Sep. 1905	"
4	"	Oct. 1905	Jan. 1906
5	"	Nov. 1905	Feb. 1906
6	"	"	Mar. 1906
7	"	"	"
8	"	Jan. 1906	Apr. 1906
9	"	"	"
10	"	Mar. 1906	May 1906
11	"	Feb. 1906	July 1906

Length	143 feet
Beam	15½ feet
Displacement	
Surface	285 tons
Submerged	313 tons
Engine	Petrol
Screw	1
Performance	
Surface	600 B.H.P. 12 knots
Submerged	190 S.H.P. 7 knots
Endurance	1,000 miles at 8¾ knots
Hull	Single
Armament	Two 18 inch T.T.s
Complement	Two Officers, eleven Ratings

(First British submarines to be fitted with fore hydroplanes.)

D(4)

'C' Class (All built by Vickers except 'C.17-18')

No.	Completed	No.	Completed		
1	1906	10	1907		
2	"	11	"		
3	1907	12	1908		
4	"	13	"		
5	1906	14	"		
6	1907	15	"		
7	"	16	"		
8	"	17	"	Chatham	Dockyard
9	"	18	"	"	"

Length 143 feet

Beam 13½ feet

Displacement

Surface 290 tons

Submerged 320 tons

Engine Petrol

Screw 1

Performance

Surface 600 B.H.P. 12 knots

Submerged 200 S.H.P. 7 knots

Endurance

Surface 1,000 miles at 8¾ knots

Submerged 40 miles

Hull Single

Armament Two 18 inch Bow T.T.s

Complement Two Officers, fourteen Ratings

(Fitted with two periscopes)

(C19-38 Built 1908-9: Submerged Speed 8 knots: Endurance 1300 miles)

D(5)

'D' Class

No.	Builder	Completed
1	Vickers	1910
2	"	"
3	"	1911
4	"	"
5	"	1912
6	"	"
7	Chatham Dockyard	1911
8	" "	1912

Length 165 feet

Beam 20½ feet

Displacement

Surface 494 tons

Submerged 620 tons (D.1 - 595 tons)

Engines Vickers Diesel

Screws Two

Performance

Surface 1,750 B.H.P. 16 knots (D.1 - 1200 B.H.P. 14½ knots)

Submerged 550 S.H.P. 10 knots (D.1 - 9 knots)

Endurance

Surface 2,500 miles at 10 knots

Submerged 60 miles

Armament

Torpedo Tubes Two 18 inch Bow

One 18 inch Stern

Guns Two 12 Pounders

Complement Three Officers, 24 Ratings.

('D.4' was the first British submarine to mount a deck gun. First class to be equipped with W/T in design - recognition of value in reconnaissance role.)

D(6)

'E' Class

	No.	Completed	Builder
E.1 Type	1-2	1913	Chatham Dockyard
	3	1915	Vickers
	4-6	1913	Vickers
	AE1-2	1914	Vickers (Built for Royal Australian Navy)
E.7 Type			
	7-8	1913	Chatham Dockyard
	9	1913	Vickers
(Orders placed	10	Aug. 1914	Vickers
in 1912-13)	11	Sep. 1914	Vickers
	12	Oct. 1914	Chatham Dockyard
	13	Dec. 1914	Chatham Dockyard
	14	Dec. 1914	Vickers
	15	Oct. 1914	Vickers
	16	Feb. 1915	Vickers
	17	Apr. 1915	Vickers
	*18	June 1915	Vickers
(Orders placed	19	July 1915	Vickers
in Nov.1914)	20	Aug. 1915	Vickers
E.21 Type			
	21	Oct. 1915	Vickers
	22	Nov. 1915	Vickers
	23	Dec. 1915	Vickers
	24	Jan. 1916	Vickers
	25	Oct. 1915	Beardmore (Clyde)
	26	Dec. 1915	Beardmore

* ('E.10-18' took from 20 to 30 months to complete from date of order. Of the subsequent 'E' class submarines, several were completed in eight to ten months.)

D(6)

'E' Class (continued)

No.	Completed	Builder
27	Aug. 1917	Yarrow (Clyde)
28	(cancelled)	
29	Oct. 1915	Armstrong Whitworth (Tyne)
30	Dec. 1915	Armstrong Whitworth
31	Dec. 1915	Scotts (Greenock)
32	Oct. 1916	White (Cowes)
33	Nov. 1916	Thorneycroft (Southampton)
34	Mar. 1917	Thorneycroft
35	July 1916	John Brown (Clyde)
36	Nov. 1916	John Brown
37	Mar. 1916	Fairfield (Clyde)
38	July 1916	Fairfield
39	Oct. 1916	Palmers (Tyne)/Armstrong Whitworth
40	May 1917	Palmers/Armstrong Whitworth
41	Feb. 1916	Cammell Laird (Birkenhead)
42	June 1916	Cammell Laird
43	Mar. 1916	Swan Hunter (Tyne)
44	July 1916	Swan Hunter
45	Aug. 1916	Cammell Laird
46	Oct. 1916	Cammell Laird
47	Oct. 1916	Fairfield/Beardmore
48	Mar. 1917	Fairfield/Beardmore
49	Dec. 1916	Swan Hunter
50	Jan. 1917	John Brown
51	Jan. 1917	Scotts
52	Mar. 1917	Denny (Dumbarton)
53	Mar. 1916	Beardmore
54	May 1916	Beardmore
55	Mar. 1916	Denny
56	Aug. 1916	Denny

D(6)

'E' Class (continued)

Length	181 feet
Beam	22½ feet
Displacement	
Surface	660 tons
Submerged	800 tons
Engines	Vickers-Admiralty diesel
Screws	Two
Performance	
Surface	1,600 B.H.P. 15½ knots
Submerged	840 S.H.P. 10 knots
Endurance	
Surface	3,000 miles at 10 knots; 2,600 miles at 10 knots (2nd group)
Submerged	99 miles at 3 knots
Hull	Saddle Tank
Armament	
Torpedo Tubes	Two 18 inch Bow
	Two 18 inch Beam: One 18 inch Stern (Minelayer one 18 inch Bow)
Guns	One 12 Pounder or 4 inch
Complement	Three Officers, 28 Ratings

('E.24', '34', '41', '45-46', '51' were all fitted as minelayers. They had no beam tubes but had minetubes and carried twenty mines.)

D(7)

'S' Class

No.	Builder	Ordered	Completed
1	Scotts)		Aug. 1914
2	")	1912-13	May 1914
3	")		Sep. 1915

Length 148 feet

Beam 14 feet

Displacement

Surface 252 tons

Submerged 386 tons

Engines Diesel

Screws Two

Performance

Surface 650 B.H.P. 15¼ knots

Submerged 400 S.H.P. 8½ knots

Endurance

Surface 1,600 miles at 8½ knots

Submerged 75 miles at 4-5 knots

Hull Double

Armament Two 18 inch Bow T.T.s

Complement Two Officers, sixteen Ratings.

(Transferred to Italian Government in 1916)

D(8)

'W' Class (All built by Armstrong Whitworth)

No.	Ordered	Completed
1)		Jan. 1915
2)	1912-13	May 1915
3)		Feb. 1916
4)		June 1916

Length 150 feet ('W.1-2' 171½ feet)

Beam 17 feet ('W.1-2' 15 feet)

Displacement

Surface 320 tons ('W.1-2' - 331 tons)

Submerged 490 tons ('W.1-2' - 510 tons)

Engines Schneider Lambert diesel

Screws Two

Performance

Surface 760 B.H.P. 13 knots ('W.1' - 710 B.H.P.)

Submerged 480 S.H.P. 8½ knots

Endurance 2,500 miles at 9 knots

Hull Double

Armament

Torpedo Tubes Two 18 inch Bow

Gun One 2 Pounder

Complement Two Officers, sixteen Ratings

(Transferred to Italian Government in 1916)

D(9)

'Nautilus'

No.	Builder	Ordered	Completed
N.1	Vickers	1912-13	Oct. 1917

Length	240 feet	
Beam	26 feet	
Displacement		
Surface	1,270 tons	
Submerged	1,694 tons	
Engines	Vickers diesel	
Screws	Two	
Performance		
Surface	3,700 B.H.P.	17 knots
Submerged	1,000 S.H.P.	10 knots
Endurance	5,300 miles at 11 knots	
Hull	Double	
Armament		
Torpedo Tubes	One 21 inch Bow	
	Four 18 inch Beam	
	One 21 inch Stern	
Gun	One 12 Pounder	
Complement	Four Officers, 38 Ratings	

(Experimental diesel-powered, ocean-going submarine - failed to reach operational status.)

D(10)

'Swordfish'

	No.	Completed	Builder
(Ordered 1912-13)	S.1	July 1916	Scotts

Length 231 feet

Beam 23 feet

Displacement

Surface 904 tons

Submerged 1,384 tons

Engines Laurenti steam turbines

Screws Two

Performance

Surface 3,750 B.H.P. 18 knots

Submerged 1,500 S.H.P. 10 knots

Endurance

Surface 3,000 miles at $8\frac{1}{2}$ knots

Hull Double

Armament

Torpedo Tubes Two 21 inch Bow

Four 18 inch Beam

Guns Two 12 Pounders

Complement Four Officers, 58 Ratings

(Experimental steam-driven, ocean-going submarine which was finally converted to a surface patrol boat.)

D(11)

'V' Class (All built by Vickers)

No.	Ordered	Completed
1)		May 1915
2)	1912-13	Nov. 1915
3)		Jan. 1916
4)		Mar. 1916

Length	148 feet
Beam	16¼ feet
Displacement	
Surface	364 tons
Submerged	486 tons
Engines	Vickers diesel
Screws	Two
Performance	
Surface	900 B.H.P. 14 knots
Submerged	380 S.H.P. 9 knots
Endurance	
Surface	1,200 miles at 14 knots; 3,000 miles at 9 knots
Submerged	74 miles at 5 knots
Hull	Double
Armament	
Torpedo Tubes	Two 18 inch Bow
Gun	One 2 Pounder
Complement	Two Officers, sixteen Ratings

D(12)

'F' Class

No.	Ordered	Completed	Builder
1)		Aug. 1915	Chatham Dockyard
2)	1912-13	Aug. 1917	Whites
3)		July 1916	Thorneycroft

Length 151 feet

Beam 16 feet

Displacement

Surface 353 tons

Submerged 525 tons

Engines M.A.N. diesels

Screws Two

Performance

Surface 900 B.H.P. 14½ knots

Submerged 400 S.H.P. 9 knots

Endurance

Surface 1,000 miles at 14 knots; 3,000 miles at 9 knots

Submerged 90 miles at 3 knots

Hull Double

Armament

Torpedo Tubes Two 18 inch Bow

One 18 inch Stern

Gun One 2 Pounder

Complement Two Officers, sixteen Ratings

D(13)

'G' Class

No.	Ordered	Completed	Builder
1	June-July 1914	Nov. 1915	Chatham
2		Mar. 1916	
3		Apr. 1916	Dockyard
4		Jan. 1916	
5		Feb. 1916	
6		May 1916	Armstrongs
7		Aug. 1916	"
8	Nov. 1914	July 1916	Vickers
9		Sep. 1916	
10		Apr. 1916	
11		May 1916	
12		June 1916	
13		Sep. 1916	
14		Aug. 1917	Scott

Length 186 feet

Beam $22\frac{1}{2}$ feet

Displacement

Surface 693 tons

Submerged 964 tons

Engines Vickers diesels

Screws Two

Performance

Surface 1,600 B.H.P. $15\frac{1}{2}$ knots (design) 14 knots (actual)

Submerged 840 S.H.P. 10 knots

Endurance

Surface 1,900 miles at 14 knots; 2,400 miles at $12\frac{1}{2}$ knots

Submerged 95 miles at 3 knots

Hull Double

Armament

Torpedo Tubes Two 18 inch Bow

Two 18 inch Beam

One 21 inch Stern

Guns One 3 inch H/A or One 12 Pounder H/A

Complement Three Officers, 28 Ratings

D(14)

'H' Class

No.	Ordered	Completed	Builder
1-2	Nov. 1914	May 1915	Vickers (Canada)
3-10	"	June 1915	"

Length	150 feet
Beam	16 feet
Displacement	
Surface	364 tons
Submerged	434 tons
Engines	NLSE diesels
Screws	Two
Performance	
Surface	480 B.H.P. 13 knots
Submerged	320 S.H.P. 11 knots (620 S.H.P. for 1 hour.)
Endurance	
Surface	2,000 miles at 13 knots; 1,600 miles at 10 knots
Submerged	30 miles at 5 knots
Hull	Single
Armament	
Torpedo Tubes	Four 18 inch Bow
Gun	One 6 Pounder
Complement	Three Officers, twenty Ratings.

(All boats of this class 'H.1 - 20' were based on designs by the Electric Boat Co. of America. 'H.1 - 20 were constructed in the United States and were to be delivered unarmed to Canadian Vickers. However, the latter boats were interned by the U.S. Government and not released until after America's entry into the war in 1917. Only 'H.11' and 'H.12' served with the Royal Navy since 'H.14 - 15' were transferred to the Royal Canadian Navy and 'H.13' and 'H.16 - 20' to the Chilean Navy.)

D(15)

'H.21' Class

No.	Ordered	Completed	Builder
21-22	Jan. - Feb. 1917	Jan. 1918	Vickers
23-25		Apr. 1918	
26-27		Mar. 1918 (27-1919)	
28-32		June 1918 (31/32-1919)	
33-34	June - July 1917	1919	Cammell Laird
39-40		1919	" "
41-44		1919 (44-1920)	Armstrong
47-50		1919	Beardmore
51-52		1918-19	Pembroke Dockyard

Length	171 feet
Beam	16 feet
Draught	13/14 feet
Displacement	
Surface	440 tons (410 tons Standard)
Submerged	500 tons
Engines	NLSE diesels
Screws	Two
Performance	
Surface	480 B.H.P. 13 knots
Submerged	320 S.H.P. $10\frac{1}{2}$ knots
Endurance	
Surface	1,400 miles at 11 knots; 2,200 miles at $8\frac{1}{2}$ knots
Submerged	80 hours at 2 knots; 1.6 hours at $7\frac{3}{4}$ knots.
Hull	Single (Pressure hull divided into 7 watertight compartments.)
Armament	
Torpedo Tubes	Four 21 inch Bow
Complement	Three Officers, twenty Ratings

(The original 'H' class design was slightly modified by the Admiralty to include a 21 inch torpedo armament instead of an 18 inch. Nine of the second series remained in service at the outbreak of World War II.)

D(16)

'J' Class

No.	Ordered	Completed	Builder
1)		Apr. 1916	Portsmouth Dockyard
2)		July 1916	" "
3)	Jan. 1915	June 1916	Pembroke Dockyard
4)		July 1916	" "
5)		June 1916	Devonport Dockyard
6)		Aug. 1916	" "

Length 275 feet

Beam 23 feet

Displacement

Surface 1,210 tons

Submerged 1,820 tons ('J.7' - 1,760 tons)

Engines Vickers diesel

Screws Two

Performance

Surface 3,600 B.H.P. 19½ knots

Submerged 1,350 S.H.P. 9½ knots

Endurance

Surface 2,600 miles at 19½ knots; 5,000 miles at 12½ knots

Submerged 60 miles at 5 knots

Hull Double

Armament

Torpedo Tubes Four 18 inch Bow

Two 18 inch Beam

Gun One 3 inch H/A or One 4 inch

Complement Five Officers, 39 Ratings

('J.7' (modified 'J' class) ordered May 1916, completed Sept. 1917 at Devonport Dockyard.)

D(17)

'K' Class

No.	Ordered	Completed	Builder
1	Aug. 1915	Apr. 1917	Portsmouth Dockyard
2		Feb. 1917	" "
3	June 1915	Sep. 1916	Vickers
4		Jan. 1917	"
5	Aug. 1915	May 1917	Portsmouth Dockyard
6		June 1917	Devonport "
7		July 1916	" "
8		Mar. 1917	Vickers
9		May 1917	"
10		June 1917	"
11		Feb. 1917	Armstrong
12		Aug. 1917	"
22(ex 13)		Oct. 1917	Fairfield
14		May 1917	"
15	Feb. 1916	Mar. 1918	Scott
16		Mar. 1918	Beardmore
17		Mar. 1917	Vickers

Length 338 feet

Beam 26½ feet

Displacement

Surface 1,883 tons

Submerged 2,560 tons

Engines Parsons & Brown Curtiss steam turbines

Screws Two

Performance

Surface 10,000 B.H.P. 24 knots (Aux. diesel generator 800 B.H.P.)

Submerged 1,400 S.H.P. 9 knots

Endurance

Surface 3,000 miles at 13½ knots

Submerged 83 miles at 1¾ knots

Hull Double

D(17)

'K' Class (continued)

Armament

Torpedo Tubes	Four 18 inch Bow
	Four 18 inch Beam
	Two 18 inch External Mountings (Upper Deck)
Guns	One 3 inch H/A
	Two 4 inch
Complement	Five Officers, 45 Ratings

Lost:- 'K.1' (1917); 'K.4' (1918); 'K.13' (salved - renumbered 'K.22');
'K.5' (1921).

(The 'K' class submarines were the only steam driven submarines in British Service. Steam was adopted in order to obtain greater speed than offered by existing diesel engines so that these boats could accompany the Fleet. In addition to steam turbines a diesel oil engine was fitted for (1) driving the dynamo charging the batteries (2) supplying propulsive power during the interval of changing from steam to motor propulsion or vice-versa.)

D(18)

'K.23' Class (Improved K Class)

No.	Ordered	Laid Down	Launched	Completed	Builder
K.26	Apr. 1918	June 1918	Aug. 1919	June 1923	Vickers Chatham Dockyard

Length	351 feet (o.a.), 347 feet (p.p.)
Beam	28 feet
Draught	17 feet 10 inches (full load)
Displacement	
Surface	2,140 tons (2,300 tons +) full load
	1,710 tons (1,890 tons +) Standard
Submerged	2,770 tons (2,800+)
Engines	Geared Steam Turbines
Screws	Two
Performance	
Surface	10,000 B.H.P. $23\frac{1}{2}$ knots ($22\frac{1}{2}$+)
Submerged	1,400 S.H.P. 9 knots (8+)
Endurance	
Surface	2,240 miles at 8 knots
Submerged	1 hour at 8 knots; 11 hours at 3 knots
Hull	Double
Armament	
Torpedo Tubes	Six 21 inch Bow
	Four 21 inch Beam (Four 18 inch Beam+)
	Two 21 inch Stern
Guns	Three 4 inch
	Two Lewis M.G.
Complement	Six Officers, 59 Ratings

('K.23-25, 27-28' were cancelled)

(Alterations were made to the forward topside buoyancy tanks to give more forward buoyancy in a seaway.)

D(19)

'L' Class

	No.	Completed	Builder
(Orders placed	1	Nov. 1917	Vickers
Feb. 1916)	2	Dec. 1917	Vickers
(Orders placed	3	Jan. 1918	Vickers
May 1916)	4	Feb. 1918	Vickers
	5	May 1918	Swan Hunter
	6	1918	Beardmore
	7	Dec. 1917	Cammell Laird
	8	Sep. 1917	Devonport Dockyard
Ordered Aug.1916	9	May 1918	Denny
	10	June 1918	Pembroke
	11-12	1918	Vickers
	14	1918	Vickers
	15	Mar. 1918	Fairfield
	16	June 1918	Fairfield
	17	1918	Vickers
	18-20	1919	Vickers
	21	1920	Vickers
	22	1921	Vickers
	23	1924	H.M. Dockyard
	25	1920	Vickers
	26	Delayed completion	H.M. Dockyard
	27	" "	" "
	28-32	1918-19	Vickers
	33	1919	Swan Hunter

D(19)

'L' Class (continued)

Length	238½ feet ('L.1-8' - 231 feet)
Beam	23½ feet
Displacement	
Surface	890 tons (full load); 760 tons (Standard)
Submerged	1,080 tons ('L.1-8' - 1,070 tons) Standard
Engines	Diesel
Screws	Two
Performance	
Surface	2,400 B.H.P. 17½ knots ('L.1-8' - 17.2)
Submerged	1,600 S.H.P. 10½ knots
Endurance	
Surface	2,850 at 17.6 knots (A) ('L.1-8' - 2,950 at 17.2 (A))
	5,800 at 10 knots (LE) & (L)
Submerged	200 miles at 2 knots
Hull	Saddle Tank
Armament	
Torpedo Tubes	Four 21 inch Bow ('L.1-8' - Four 18 inch Bow)
	Two 18 inch Beam
Gun	One 4 inch ('L.1-8' - 3 inch)
Complement	Three Officers, 36 Ratings (A)
	(3 + 32 (L) & (LE))

(A): Admiralty; (L): Lipscomb; (LE): Lenton.

D(20)

'L.50' Class

No.	Ordered	Laid Down	Completed	Builder
50-51	Feb. 1917	1917	?	Cammell Laird
52			1921	Armstrong
53*			1925	"
54*			1924	Denny
55-58	Apr. 1917		(55)1918 (56)1919	Fairfield
59	Apr. 1918	1918	?	Beardmore
60-61			?	Cammell Laird
62			?	Fairfield
63-64			?	Scott
65-66			?	Swan Hunter
67-68	Apr. 1917	1917	?	Armstrong
69-70			*(69)1923	Beardmore
71-72			(71)1920	Scott
73			?	Denny
74	Apr. 1918	1918	?	"

* Completed H.M. Dockyards 1923-26.

Length 235 feet

Beam 23½ feet

Displacement

Surface 960 tons (full load); 845 tons (Standard)

Submerged 1,150 tons (Standard)

Engines Diesel

Screws Two

Performance

Surface 2,400 B.H.P. 17½ knots

Submerged 1,600 S.H.P. 10½ knots

Endurance

Surface 5,000 miles at 17½ knots; 4,500 miles at 8 knots

Submerged 80 miles at 3 knots

Hull Saddle Tank

Armament

Torpedo Tubes Six 21 inch Bow

Guns Two 4 inch

Complement Four Officers, 38 Ratings

D(21)

'M' Class

No.	Ordered	Completed	Builder
1 (ex K.18)	Feb. 1916	1918	Vickers
2 (ex K.19)	May 1916	1920	"
3 (ex K.20)	Aug. 1916	1920	Armstrong-Whitworth
4 (ex K.21)	Aug. 1916	(Sold in uncompleted state 1921)	

Length 296 feet

Beam 24½ feet

Displacement

Surface 1,600 tons (full load); 1,450 tons (Standard)

Submerged 1,950 tons (Standard)

Engines Diesel

Screws Two

Performance

Surface 2,400 B.H.P. 15½ knots

Submerged 1,600 S.H.P. 9½ knots

Endurance

Surface 4,000 miles at 11 knots; 3,840 miles at 10 knots

Submerged 80 miles at 2 knots

Hull Double

Armament

Torpedo Tubes Four 18 inch Bow ('M.3' - Four 21 inch Bow)

Guns One 12 inch (MK 9)

One 3 inch H/A

Complement Six Officers, 59 Ratings (61)

('M.2' converted to experimental seaplane-carrier - foundered 1932)

('M.3' converted to experimental minelayer - sold 1932)

D(22)

'R' Class

No.	Ordered	Laid Down	Completed	Builder
1-4)		1917	(4) 1919	Chatham Dockyard
5-6)		Cancelled		
7)	Oct.		June 1918	Vickers
8)	1917		July 1918	"
9-10)				Armstrong-Whitworth
11-12)			July 1918	Cammell Laird

Length 163 feet

Beam 15¾ feet

Displacement

Surface 420 tons (full load); 385 tons (Standard)

Submerged 500 tons (Standard)

Engine Diesel

Screw One

Performance

Surface 240 B.H.P. 9½ knots

Submerged 1,200 S.H.P. 15 knots

Endurance

Surface 2,200 miles at 9½ knots

Submerged 15 miles at 15 knots; 240 miles at 4 knots

Hull Single

Armament

Torpedo Tubes Six 18 inch Bow

Guns One 4 inch

Complement Two Officers, twenty Ratings

D(23)

'X.1'

Ordered	No.	Launched	Completed	Builder
Aug. 1921	'X.1'	June 1925	Sep. 1925	Chatham Dockyard

Length	361 feet 10 inches (o.a.); 350 feet (p.p.)
Beam	29 feet 10 inches
Draught	15 feet 9 inches
Displacement	
Surface	3,050 tons (full load); 2,425 tons (Standard)
	2,280 tons (N.M.M.)
Submerged	3,600 tons (Standard)
Engines	Diesel
Screws	Two
Performance	
Surface	6,000 B.H.P. 19½ knots
Submerged	2,600 S.H.P. (2,400 designed) 9 knots
Endurance	
Surface	12,400 miles at 12 knots
Hull	Double
Armament	
Torpedo Tubes	Six 21 inch Bow
Guns	Four 5.2 inch (Twin turrets - Director firing - 9 feet range finder - horizontal base, worked from within each turret.)
Complement	Six Officers, 104 Ratings

(Designed to fight as much on the surface as submerged. Twin gun mountings carried forward and aft of the conning tower, well clear of the waterline on a high casing built on top of a double hull. At time of completion 'X.1' was the largest submarine in the world.)

N.M.M.: National Maritime Museum.

D(24)

'Oberon' (ex '0.1')

Name	Laid Down	Launched	Completed	Builder
Oberon	1924	Sep. 1926	1927	Chatham Dockyard

Length	275 feet (o.a.); 266¾ feet (p.p.)
Beam	28 feet
Draught	15½ feet (full load)
Displacement	
Surface	1,490 tons (full load); 1,511 tons (Standard)
Submerged	1,805 tons (Standard)
Engines	Vickers diesel (6 cylinder)
Screws	Two
Performance	
Surface	3,000 B.H.P. 15 knots
Submerged	1,350 S.H.P. 9 knots
Endurance	
Surface	6,500 miles at 10 knots
Hull	Saddle Tank
Armament	
Torpedo Tubes	Six 21 inch Bow
	Two 21 inch Stern
Gun	One 4 inch
Complement	Five Officers, 51 Ratings

(With only two exceptions - 'Swordfish' and 'Nautilus' - all previous British submarines had been numbered. '0.1', renamed 'Oberon' before launching, and all subsequent British submarines were named from the beginning. Shortly after the outbreak of World War II, the practice of numbering only was restored. Consequently only the 'T' and 'U' class submarines of the 1939 Programme received names. However, despite official ruling to the contrary, most submarines crews adopted unofficial names with the initial letter S, T, or U as applicable. In early 1945 the Admiralty, in deference to the Submarine Service, returned to the policy of naming submarines and existing unofficial names were allowed to stand.)

D(25)

'O' Class (Improved 'Oberon')

Name	Laid Down	Launched	Completed	Builder
Odin)		May 1928)		Chatham Dockyard
Olympus)		Dec. 1928)		Beardmore
Orpheus)	1927	Feb. 1929)	1929	"
Osiris)		May 1928)		Vickers-Armstrongs
Oswald)		June 1928)		"
Otus)		Aug. 1928)		"

Length: 285 feet (o.a.); 265 feet (p.p.)

Beam 30 feet

Draught 15½ feet

Displacement

Surface 1,750 tons (full load); 1,475 tons (Standard)

Submerged 2,035 tons (Standard)

Engines Admiralty diesel

Screws Two

Performance

Surface 4,400 B.H.P. 17½ knots

Submerged 1,320 S.H.P. 9 knots

Endurance

Surface 8,500 miles at 10 knots; 10,000 miles at 8 knots

Hull Saddle Tank

Armament

Torpedo Tubes Six 21 inch Bow

Two 21 inch Stern

Gun One 4 inch

Complement Five Officers, 51 Ratings

('Oberon' had been fitted with the forward hydroplanes at the bottom of the pressure hull. In the 'O' class and la ter submarines these 'planes were moved to the top of the pressure hull and, although resulting in a slower dive, this move allowed the 'planes to be turned-in when not in use, thereby making them less liable to damage and allowing greater ease of access for maintenance.)

D(26)

'P' Class

Name	Launched	Completed	Builder
Parthian	July 1929	1930	Chatham Dockyard
Perseus	May 1929	"	Vickers-Armstrongs
Phoenix	Oct. 1929	"	Cammell Laird
Poseidon	June 1929	"	Vickers-Armstrongs
Proteus	July 1929	"	"
Pandora	Aug. 1929	"	"

Length 289 feet 2 inches (o.a.); 271 feet (p.p.)
Beam 29 feet $9\frac{3}{4}$ inches
Draught 15 feet $10\frac{1}{2}$ inches (full load)

Displacement
Surface 1,760 tons (full load); 1,559 tons (Standard)
Submerged 2,040 tons
Engines Diesel
Screws Two

Performance
Surface 4,640 B.H.P. $17\frac{1}{2}$ knots
Submerged 1,320 S.H.P. 9 knots

Endurance
Surface 8,400 miles at 10 knots; 10,000 miles at 8 knots
Hull Saddle Tank

Armament
Torpedo Tubes Six 21 inch Bow
Two 21 inch Stern
Gun One 4 inch

Complement Five Officers, 51 Ratings

D(27)

'R' Class

Name	Launched	Completed	Builder
Rainbow	May 1930	1931	Chatham Dockyard
Regent	June 1930	"	Vickers-Armstrong
Regulus	"	"	"
Rover	"	"	"

Length 289 feet 2 inches (o.a.); 273 feet (p.p.)
Beam 29 feet $9\frac{3}{4}$ inches
Draught 15 feet $10\frac{1}{2}$ inches (full load)

Displacement
Surface 1,762 tons (full load); 1,574 tons (Standard)
Submerged 2,045 tons
Engines Diesel
Screws Two

Performance
Surface 4,400 B.H.P. $17\frac{1}{2}$ knots
Submerged 1,320 S.H.P. 9 knots

Endurance
Surface 8,000 miles at 10 knots; 10,000 miles at 8 knots
Submerged 1 hour at 9 knots; 30 hours at 5 knots
Hull Saddle Tank: diving depth 500 feet

Armament
Torpedo Tubes Six 21 inch Bow
Two 21 inch Stern
Gun One 4.7 inch
Complement Five Officers, 51 Ratings

(The 'O', 'P', and 'R' classes suffered 75% losses when transferred to the Mediterranean during World War II, emphasising the unsuitability of large submarines in coastal or shallow waters.)

D(28)

'River' Class (ex 'G' Class)

Name	Launched	Completed	Builder
Thames	Jan. 1932	1932	Vickers Armstrongs
Clyde	Mar. 1934		"
Severn	Jan. 1934		"

Length	345 feet (o.a.) 325 feet (p.p.)
Beam	28 feet
Draught (mean)	16 feet ('Thames': 15 feet 7½ inches)
Displacement	
Surface	2,200 tons; 1835 tons (Standard) ('Thames': 2,165 tons; 1,810 tons (Standard).)
Submerged	2,710 tons ('Thames': 2,680 tons)
Engines	Admiralty Diesels
Screws	Two
Performance	
Surface	10,000 B.H.P. 21½ knots ('Thames': 7,500-10,000: 20½-21¾ knots)
Submerged	2,500 S.H.P. 10 knots
Endurance	
Surface	10,000 miles at 8 knots; 2,800 miles at 21 knots ('Thames': 10,000 miles at 10 knots)
Submerged	90 miles at 3 knots; 10 miles at 10 knots 30 hours at 3 knots; 1 hour at 10 knots
Hull	Double
Armament	
Torpedo Tubes	Six 21 inch Bow
Gun	One 4 inch (or 4.7 inch)
Complement	Five Officers, 56 Ratings

(These submarines were the final British attempt to produce a fleet model. A speed of 21½ knots was obtained using diesel engines but contemporary capital ships were approaching 30 knots speed and therefore interest in fleet submarines declined. More so as submarine tonnage was limited under the 1930 London Naval Treaty and two patrol submarines ('T' class) were possible for the approximate tonnage of 1 'River' class submarine.)

D(29)

'Porpoise' Class

Name	Launched	Completed	Builder
Porpoise	Aug. 1932	1933	Vickers-Armstrong
Grampus	Feb. 1936	1936	Chatham Dockyard
Narwhal	Aug. 1935	"	Vickers-Armstrong
Rorqual	July 1936	1937	"
Cachalot	Dec. 1937	1938	Scotts
Seal	Sep. 1938	1939	Chatham Dockyard

Length — 292½ feet (o.a.); 271½ feet (p.p.);
(Porpoise 288 feet (o.a.); 267 feet (p.p.))

Beam — 25½ feet (Porpoise 29¾ feet)

Draught — 17 feet (full load) (Porpoise 15 feet)

Displacement

Surface — 1,805 tons (full load;) 1,555 tons (Standard)
(Porpoise 1,770 tons (full load); 1500 tons (Standard))

Submerged — 2,115 tons (Porpoise 2,060 tons)

Engines — Admiralty diesel

Screws — Two

Performance

Surface — 3,300 B.H.P. 16 knots (with mines) (15 knots design speed)

Submerged — 1,630 S.H.P. 8¾ knots

Endurance

Surface — 7,400 miles at 10 knots

Hull — Double

Armament

Torpedo Tubes — Six 21 inch Bow

Gun — One 4 inch

Mines — Fifty

Complement — Five Officers, 54 Ratings

D(30)

'S' Class (1932)

	Name	Launched	Builder
	(Swordfish	Nov. 1931	Chatham Dockyard
1st	(Sturgeon	Jan. 1932	" "
Group	(Seahorse	Nov. 1932	" "
(1G)	(Starfish	Mar. 1933	" "
	(Sealion	Mar. 1934	Cammell Laird
	(Shark	May 1934	Chatham Dockyard
2nd	(Salmon	Apr. 1934	Cammell Laird
Group	(Snapper	Nov. 1934	Chatham Dockyard
(2G)	(Seawolf	Nov. 1935	Scotts
	(Spearfish	Apr. 1936	Cammell Laird
	(Sunfish	Sep. 1936	Chatham Dockyard
	(Sterlet	Sep. 1937	" "

(Another 50 units comprising a 3rd Group were built between 1941-45.)

Length	$202\frac{1}{2}$ feet (o.a.) (1G); 208 feet (o.a.) (2G);
	187 feet (p.p.) (1G); 193 feet (p.p.) (2G)
Beam	24 feet
Draught (mean)	12 feet (1G); 13 feet (2G)
Displacement	
Surface	735 tons; 640 tons (Standard) (1G)
	765 tons; 670 tons (Standard) (2G)
Submerged	935 tons (1G); 960 tons (2G)
Engines	Admiralty diesel
Screws	Two
Performance	
Surface	1,550 B.H.P. 14.3 knots
Submerged	1,300 S.H.P. 9.6 knots (1 hour)
Endurance	
Surface	3,600 miles at 10 knots
Submerged	36 hours at 2 knots and 1 hour at 10 knots (1G)
	45 hours at 3 knots (2G)

D(30)

'S' Class (continued)

	Hull	Saddle Tank
Diving Depth		300 feet
Armament		
Torpedo Tubes		Six 21 inch Bow
Gun		One 3 inch H/A
Complement	Four Officers, 32 Ratings: 34 Ratings (2G)	

D(31)

'T' Class

Name	Launched	Builder
Triton	Oct. 1937	Vickers Armstrongs
*Thetis	June 1938	Cammell Laird
Tribune	Dec. 1938	Scotts
Trident	Dec. 1938	Cammell Laird
Triumph	Feb. 1938	Vickers Armstrongs
Taku	May 1938	Cammell Laird
Thistle	Oct. 1938	Vickers Armstrongs
Triad	May 1939	" "
Truant	May 1939	" "

(* Foundered Liverpool Bay 1 June 1939. Salved April 1940 and renamed Thunderbolt.) Further 66 units completed between 1939-45.

Length	275 feet (o.a.), 245 feet 3 inches (p.p.) ('Triton' 277 feet (o.a.), 265 feet (p.p.).)
Beam	$26\frac{1}{2}$ feet ('Triton' 26 feet)
Draught	14 feet 7 inches
Displacement	
Surface	1,325 tons ('Triton' 1,330 tons; 1,095 tons (Standard))
Submerged	1,573 tons ('Triton' 1,595 tons)
Engines	Admiralty Diesels (6 cylinder) (also Vickers, Sulzer, and M.A.N.)
Screws	Two
Performance	
Surface	2,500 B.H.P. $15\frac{1}{4}$ knots
Submerged	1,450 S.H.P. 9 knots
Endurance	
Surface	8,000 miles at 10 knots, 4,500 miles at 11 (foul bottom)
Submerged	55 hours at $2\frac{3}{4}$ knots
Hull	Saddle Tank
Diving Depth	300 feet
Armament	
Torpedo Tubes	Eight 21 inch Bow (6 internal; 2 external)
	Two 21 inch Beam (later turned aft plus one external stern tube.)
Gun	One 4 inch
Complement	Five Officers, 51 Ratings

D(32)

'U' Class

Name	Launched	Builder
Undine	Oct. 1937	Vickers Armstrongs
Unity	Feb. 1938	" "
Ursula	Feb. 1938	" "

(Further 46 units built between 1940-45.)

Length	191 feet (o.a.); 171¾ feet (p.p.)
Beam	16 feet 5 inches
Draught (mean)	14 feet
Displacement	
Surface	630 tons; 540 tons (Standard)
Submerged	730 tons
Engines	Admiralty Diesels (6 cylinder)
Screws	Two
Performance	
Surface	625 B.H.P. 11¾ knots
Submerged	825 S.H.P. 9 knots
Endurance	
Surface	4,050 miles at 10 knots
Submerged	60 hours at 2 knots; 2 hours at 9 knots.
Hull	Single
Diving Depth	200 feet
Armament	
Torpedo Tubes	Six 21 inch Bow (4 internal; 2 external)
Gun	One 12 Pounder or 3 inch A/A (2G)
Complement	Three Officers, 34 Ratings (L): 33 Ursula (LG): 27 Unity and Undine (LG)

APPENDIX E: PRELIMINARY DESIGN PROPOSALS FOR CERTAIN SUBMARINE MODELS AND CLASSES

E(1) PROPOSED DESIGN OF STEAM POWERED FLEET SUBMARINE

D.N.C. to Third Sea Lord, 21 Nov. 1913, N.M.M., Tennyson-d'Eyncourt Papers.

(Some papers contain reference to pre-war Tactical Exercises at War College.)

Length .. .. .. 338 feet (oa)

Beam .. .. .. 29 feet

Displacement:

Surface . .. .. 1660 tons

Submerged .. .. 2660 tons

Engines: Steam driven geared turbines

Speed:

Surface . .. .. 24 knots

Submerged .. .. 10 knots

Endurance: 1,100 n. miles at 24 knots

2,500 n. miles at cruising speed

Armament:

Torpedo tubes .. 2 bow

4-21 inch beam

2 stern

Guns .. .. .. 2-3 inch A.A.

E(2)

SMALL TYPE SUBMARINES

Financial Year	'L' or 'L.50' class under 12 yrs of age at end of year	Proposed new construction to be completed (Programme year in brackets)	Resulting no.s under 12 years at end of year
1951-52	10 (& 1'H')	2 (1929)	15
1952-53	7	2 (1930)	11
1953-54	6	2 (1931)	12
1954-55	6	0	12
1955-56	5	2 (1933)+	15
1956-57	2	2 (1934)+	12
1957-58	1	2 (1935)+	15
1958-59	0	0	12

+ Provisional only

In addition to the submarines shown in the table it was intended that there would be the following additional boats at the end of the financial year 1951-32, according to the existing approved scrapping programme:-

Five 'L' or 'L.50' class, five 'H' class, 'R.4'. All under thirteen years of age.

Six 'L' class under fourteen years.

One 'L' class under fifteen years.

Four 'H' class provisionally earmarked for scrapping during the year 1932-33.

E(3)

ALTERNATIVE 'S' CLASS DESIGNS PREPARED BY D.N.C.

	'S.1'	'S.2'
Length overall	177 feet 6 inches	196 feet
Diam. of P.H.	15	15
Displacements: Geneva	604 tons	705 tons
Surface	690 tons	800 tons
Submerged	about 800 tons	about 920 tons
B.H.P. main engines	1450	1650
Speed Surface	14 knots	14 knots
B.H.P. motors	840	1000
Speed Submerged	9 knots	9 knots
Endurance (Surface)	3250 miles at 9 knots	3250 miles at 9 knots
" (Submerged)	50 miles at 4 knots	75 miles at 4 knots
Armament	3 inch H.A. gun	3 inch H.A. gun
	2 Lewis guns	2 Lewis guns
	4-21 inch T.T.	6-21 inch T.T.
	8 Torpedoes	12 Torpedoes
Diving Depth	300 feet	300 feet

E(4)

SKETCH DESIGNS PREPARED BY D.N.C., 19 APRIL 1954

FOR 1000 TONS SUBMARINE

	Design A	Design B
Length overall	260 feet	250 feet
Beam	22 feet	22 feet
Mean Surface Draught	15 feet 6 inches	15 feet 7 inches
Surface Displacement	1260 tons	1195 tons
Standard "	1065 tons	990 tons
Submerged "	1540 tons	1455 tons
B.H.P. of Engines	2500 tons	2500 tons
Speed at Surface Displacement	14.8 knots	15 knots
Endurance at 8 knots	9,500 miles	11,000 miles
Endurance at 11 knots	6,000 miles	7,200 miles
H.P. of Motors	1300	1300
Submerged Speed	9 knots	9 knots
Submerged Endurance at 9 knots	$2\frac{1}{2}$ hours	1 hour
" " at $1\frac{1}{2}$ knots	80 hours	55 hours
" " at 2 knots	64 hours	42 hours
Bow Torpedo Tubes	6	6
External Torpedo Tubes	4	4
Spare Torpedoes	6	6
Guns	3 inch/2 Lewis	3 inch/2 Lewis
Complement	50	48
Diving Depth	300 feet	300 feet

(Submarine intended for use in the Far East to replace 'Odin', 'Parthian' and 'Rainbow' Classes.)

E(5)

SKETCH DESIGN PREPARED BY D.N.C., 19 APRIL 1934

FOR 400 TONS SUBMARINE

Length overall	166 feet 6 inches
Beam	15 feet 9 inches
Mean Draught in diving trim	13 feet 8 inches
Surface Displacement	460 tons
Standard Displacement	420 tons
Submerged Displacement	535 tons
B.H.P. of Engines	525
Surface Speed	11¼ knots
Endurance at 10 knots	2000 miles
H.P. of Main Motors	450
Submerged Speed	9 knots
Submerged Endurance at 9 knots	1 hour
" " at 2 knots	40 hours
21 inch Bow Torpedo Tubes	4
Reserve Torpedoes	2
Guns	2 Lewis
Complement	24 Officers 8 Men
Diving Depth	150 feet

(Submarine intended to replace 'H' class, primarily for use in A/S training in addition to war purposes.)

E(6)

R.A.(S)'s PROPOSALS FOR SMALL SUBMARINE FOR A/S TRAINING

Standard Displacement . ..	410 tons (approx.)
Hull	Single
Diving Depth	150 feet (min.)
Torpedo Armament	4-21 inch bow tubes
	4 Torpedoes in tubes plus:
	'Two Spares if possible for war
	only, in which condition crew space
	will be sacrificed if necessary.'
Gun Armament	2 Lewis guns
Main Engines	Twin Screws
	480 H.P. (240 H.P. per shaft)
	375 R.P.M.
Surface Speed	11½ knots
Cruising Speed	10 knots
Surface Endurance	2,000 miles at 10 knots
Submerged Speed	9 knots
Submerged Endurance	1 hour at full speed; Not less
	than 40 hours at slowest speed.
Complement .. .. (war)	5 Officers (1 R.N.R.) 21 Ratings
(peace)	2 Officers 21 Ratings

(27 feet periscopes were also specified and escape hatches rather than air locks. Asdic was considered essential for instructing classes of submarine personnel in the uses of submarine asdic - one of the functions of this type of submarine. Also useful in wartime.)

E(7)

COMPARISON OF EXTERNAL AND INTERNAL SUBMARINE MINELAYER DESIGNS 1930

	EXTERNAL DESIGN (C)	INTERNAL DESIGN (D)	INTERNAL DESIGN (E)
Length (overall)	288 feet	296 feet	296 feet
Displacement (Standard)	1490 tons	1500 tons	1500 tons
Mines (No.)	50	40	40
Engines (B.H.P.)	5300	1550	2700
Speed (Surface)	15 knots	11½ knots	14 knots
Battery Cells (No.)	336	336	224
Motors (B.H.P.)	1520	1300	1300
Speed (Submerged for 1 hour)	8¾ knots	8 knots	7½ knots
Endurance (2 knots)	40 hours	40 hours	25 hours
Accommodation Space	1	.9	.5
Diving Depth	300 feet	500 feet	500 feet
Cost	£380,000	£350,000	£350,000

E(8)

TABLE SHOWING ACTUAL CAPACITIES OF FREE FLOODING SPACES ABOVE SURFACE WATER LINE IN VARIOUS SUBMARINES, TOGETHER WITH THEIR PERCENTAGE OF SURFACE DISPLACEMENT.

	A Gross free flooding capacity above L.W.L. (Tons)	B Surface Displacement (Tons)	A/B %
'X.1'	680	2780	24.4
'K.26'	480	2300	21
'M.3' (Pre-conversion) ..	160	1722	9.3
'M.3' (Post-conversion) ..	770	1745	44
'Rainbow' ('R' class) . ..	240	1740	13.6
New Minelayer (external type)	480	1745	27.5

E(9)

PROPOSED PATROL AND MINELAYING SUBMARINE OF THE 1939 PROGRAMME

Length overall	218 feet
" P.P.	185 feet
Beam	25 feet
Draught (mean)	13 feet 6 inches (including water around mines)
Surface Displacement . ..	815 tons (excluding water around mines)
Standard Displacement ..	727 tons
Submerged " ..1025	tons
H.P. of Engines	1600
Surface Speed	14 knots
Surface Endurance ..	4,000 miles at 10 knots
H.P. of Main Motors ..	1300
Submerged Speed for 1 hour	9 knots
" Endurance at 3 knots	36 hours
Torpedo Tubes	6-21 inch bow
Reserve Torpedoes	6
Gun	1-3 inch
Mines	12
Diving Depth	300 feet
Complement	38

APPENDIX F: VARIOUS PROPOSALS ON SUBMARINE TYPES

F(1) SUMMARY OF QUESTIONS TO AND REPLIES FROM C. IN C.'s ATLANTIC AND MEDITERRANEAN FLEETS

QUESTIONS	ATLANTIC	MEDITERRANEAN	NOTE
1) Are you in favour of a new term 'Battle Submarine'	Does not consider a Battle Submarine of value.	No.	The C. in C., Med., encloses replies from his commands. They do not differ in essentials from his covering reply.
2) Does a Battle Submarine need a speed of 5 to 6 knots in excess.		'G' type are needed for Fleet Submarines. They may sometimes be able to cooperate tactically in the battle.	
3) Are the advantages of a Fleet Submarine sufficient to justify 'G' type.	Yes		
4) Should Patrol Submarine be 'G' class.	Yes	Yes	
5) Are you in favour of a small submarine.	Yes	Yes	

F(2)

OPINIONS SOUGHT ON FIVE MAJOR POINTS CONCERNING SEAPLANE-CARRYING SUBMARINES

1) The need for aircraft in submarines and the uses to which they could be put in war.

2) The type(s) of submarine(s) in which they should be carried.

3) If required for patrol submarines, whether all patrol submarines should be so equipped. If not all, what proportion.

4) Whether one (or more) submarines should be specially constructed for carrying aircraft, other requirements being reduced in order to obtain an aircraft with a better performance than is otherwise possible.

5) The requirements of the aircraft as regards:- endurance, speed, ceiling, W/T equipment, armament, etc.

Admiralty to C. in C. Mediterranean Fleet
C. in C. Atlantic Fleet
R.A.(S)
D. of T.S.

APPENDIX G: TABLES OF FLEET STRENGTHS, WARTIME LOSSES AND FUTURE CONSTRUCTION

G(1) PRE- AND POST-WAR BRITISH FLEETS COMPARED

	A	B	C	A	B	C
Classes	Full Commission	Reduced Crews	Reserve	F.C.	R.C.	R.
	1920 - 21			1914		
Battleships	16	3	12	30	15	14
Battle Cruisers	4	-	3	8	-	-
Cruisers	-	4	2	18	7	17
Light Cruisers	37	2	13	29	19	13
T.B.D.'s & T.B.'s	90	43	59	107	110	6
Submarines	33	-	38	66	-	-
Monitors	-	3	1	-	-	-
Totals	180	55	128	258	151	50

G(2)

SUMMARY OF LOSSES OF BRITISH WARSHIPS BY SUBMARINES

		Auxiliary Vessels employed in R.N.	
Battleships	5	Hospital Ship	1
Cruisers	5	Frozen Meat Ship	1
Light Cruisers	3	Mine Carriers	2
Torpedo Gunboats	1	Minesweepers	1
Monitors	1	Fleet Messengers	6
Sloops	11	Commissioned research ships	3
Flotilla Leaders	1	Miscellaneous	2
T.B.D.'s	7	Colliers	195
T.B.'s	2	Oilers	35
Submarines	4	Special Service Ships	22
Aircraft Carriers	1	Tugs	1
Minelayers	1	Yachts	2
Armed Merchant Cruisers	11	Admiralty Trawlers	3
Armed Boarding Steamers	9	Hired Trawlers	14
		Hired Drifters	3
	62		289

G(2)

MERCANTILE MARINE LOSSES BY ENEMY SUBMARINE ACTION

Allies		Neutrals	
United Kingdom	7,684,223	Norway	1,170,815
France	898,874	Sweden	200,313
Russia	185,852	Denmark	239,922
Belgium	81,408	Holland	199,975
Japan	112,848	Spain	162,123
Italy	844,489	Peru	1,419
Portugal	84,151	Argentina	4,275
Roumania	5,688	Uruguay	6,889
U.S.A.	574,765	Total Neutral Tonnage	1,985,729
Greece	537,545		
Brazil	25,464		
Total Allied Tonnage	10,651,297		

Grand Total: 12,617,026

G(3)

NAVAL STAFF CALCULATIONS OF UNITED STATES PROPOSALS:

TOTALS TO BE RECEIVED BY THE THREE NATIONS INVOLVED

	Submarines Built	Building	Submerged Tonnage	Surface Tonnage
British Empire	93	7	101,261	80,476
United States	105	37(a)	66,038	53,457
			40,350	30,068
			106,388	83,525
Japan	20	26(b)	14,316	10,959
			28,276	21,260
			42,592	32,219

(a) Ten projected boats are not included.

(b) About 60 projected boats are not included.

G(4)

TEN YEAR BUILDING PROGRAMME (ORIGINAL PROPOSALS)

SUBMARINES BUILT AND BUILDING

Submarines over-age in preceding financial year	Submarines completed during preceding financial year	Total (Classes) H&R	L,M&O	J	K	X	Grand Total (Year)	(No.)
Nil	L.69, K.26	25	29	1	6	-		61
K.2, K.6	L.23, L.25, L.27, L.53-54.	25	34	1	4	1	1925	65
K.14	-	25	34	1	5	1	1926	64
H.21, L.1-3, L.7, J.7, K.12, K.22.	0.1	24	31	-	1	1	1927	57
H.23-26, H.28, L.5-6, L.8-9, L.11-12, L.15-16, M.1.	-	19	21	-	1	1	1928	42
H.14-15, H.22, H.27, H.29-31, L.14, L.17, L.20, R.10.	-	11	18	-	1	1	1929	31
H.32-34, H.43-44, H.47-50, H.52, R.4, L.18-19, L.33, L.56, L.71.	-	-	15	-	1	1	1930	15
L.21, L.25, L.52, M.2-3.	-	-	8	-	1	1	1931	10
L.22.	-	-	7	-	1	1	1932	9
-	-	-	7	-	1	1	1933	9
L.69, K.26	-	-	6	-	-	1	1934	7
L.23, L.26-27, L.53-54, X.1	-	-	1	-	-	-	1935	1

EFFECT OF PROPOSED PROGRAMME

Date April	PROPOSED NEW PROGRAMME: Financial Year	Type: Over-sea.	Type: Cruiser.	Type: Fleet.	OVERSEA PATROL TYPE: Past Programmes L, M & O Class.	OVERSEA PATROL TYPE: Proposed Programme	OVERSEA PATROL TYPE: TOTAL	CRUISER TYPE: Past Programmes E X Class.	CRUISER TYPE: Proposed Programme	CRUISER TYPE: TOTAL	FLEET TYPE: Past Programmes K Class.	FLEET TYPE: Proposed Programme	FLEET TYPE: TOTAL	ALL TYPES: GRAND TOTAL
1924	-				29	-	29	-	-	-	6	-	6	35
1925	-				34	-	34	1	-	1	4	-	4	39
1926	-				34	-	34	1	-	1	3	-	3	38
1927	-				31	-	31	1	-	1	1	-	1	33
1928	1925-26	8	-	-	21	8	29	1	-	1	1	-	1	31
1929	1926-27	7	1	-	18	15	33	1	1	2	1	-	1	36
1930	1927-28	4	-	4	13	19	32	1	1	2	1	4	5	39
1931	1928-29	6	2	-	8	25	33	1	3	4	1	4	5	42
1932	1929-30	6	2	-	7	31	38	1	5	6	1	4	5	49
1933	1930-31	7	1	-	7	38	45	1	6	7	1	4	5	57
1934	1931-32	6	2	-	6	44	50	1	8	9	-	4	4	63
1935	1932-33	4	-	4	1	48	49	-	8	8	-	8	8	65
1936	1933-34	6	2	-	1	54	55	-	10	10	-	8	8	73
1937	1934-35	6	2	-	-	60	60	-	12	12	-	8	8	80

After this date it will be possible to maintain 80 submarines by a regular programme of 8 a year.

G(5)

ORIGINAL PROPOSALS FOR ANNUAL SUBMARINE CONSTRUCTION PROGRAMME 1925 - 31

Programme Year	Patrol Submarine	Fleet Submarine	Cruiser Submarine
1925-26	8	-	-
1926-27	7	-	1
1927-28	4	4	-
1928-29	6	-	2
1929-30	6	-	2
1930-31	7	-	1

Total Number of Submarines - 48.

G(6)

GRAPH A

EFFECTIVE SUBMARINE STRENGTH OF BRITISH EMPIRE

1 APRIL 1928

Assumptions

1) The effective life of all submarines is twelve years.

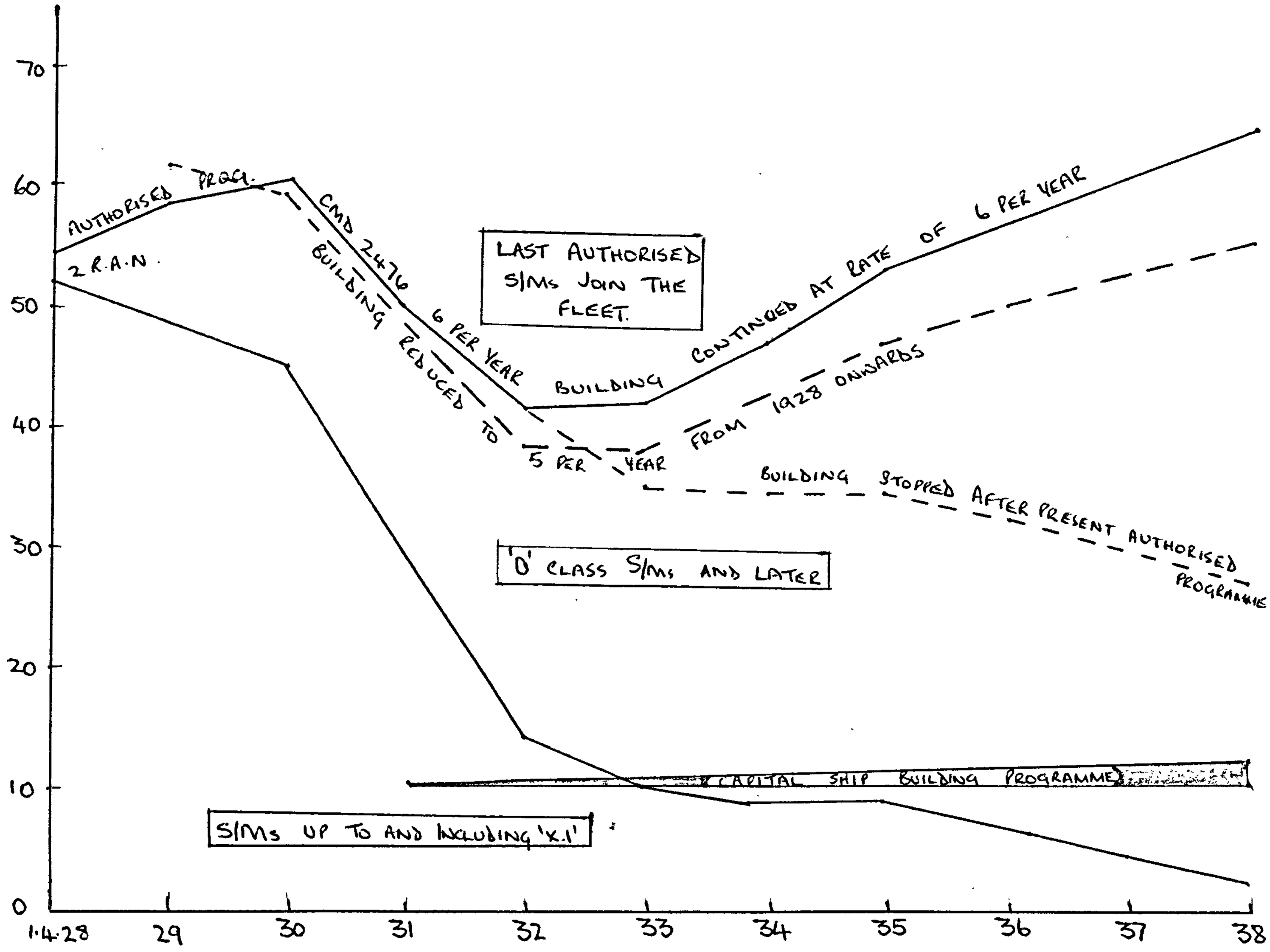
2) Australia maintains two submarines.

3) Scrapping as approved by the Board till 1 April 1930.

4) Scrapping on reaching twelve years of age after 1 April 1930.

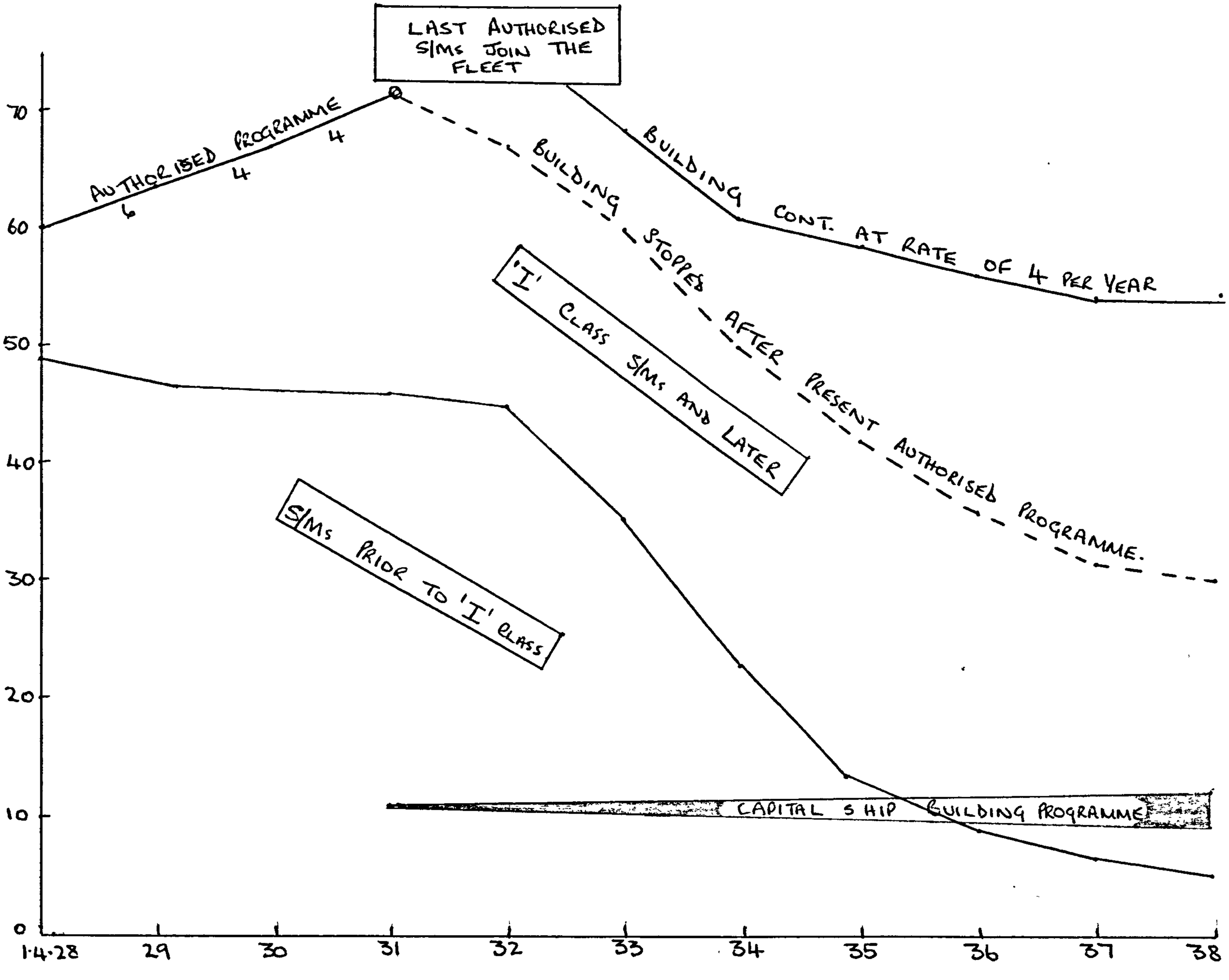
G(6)

GRAPH A BRITISH EMPIRE

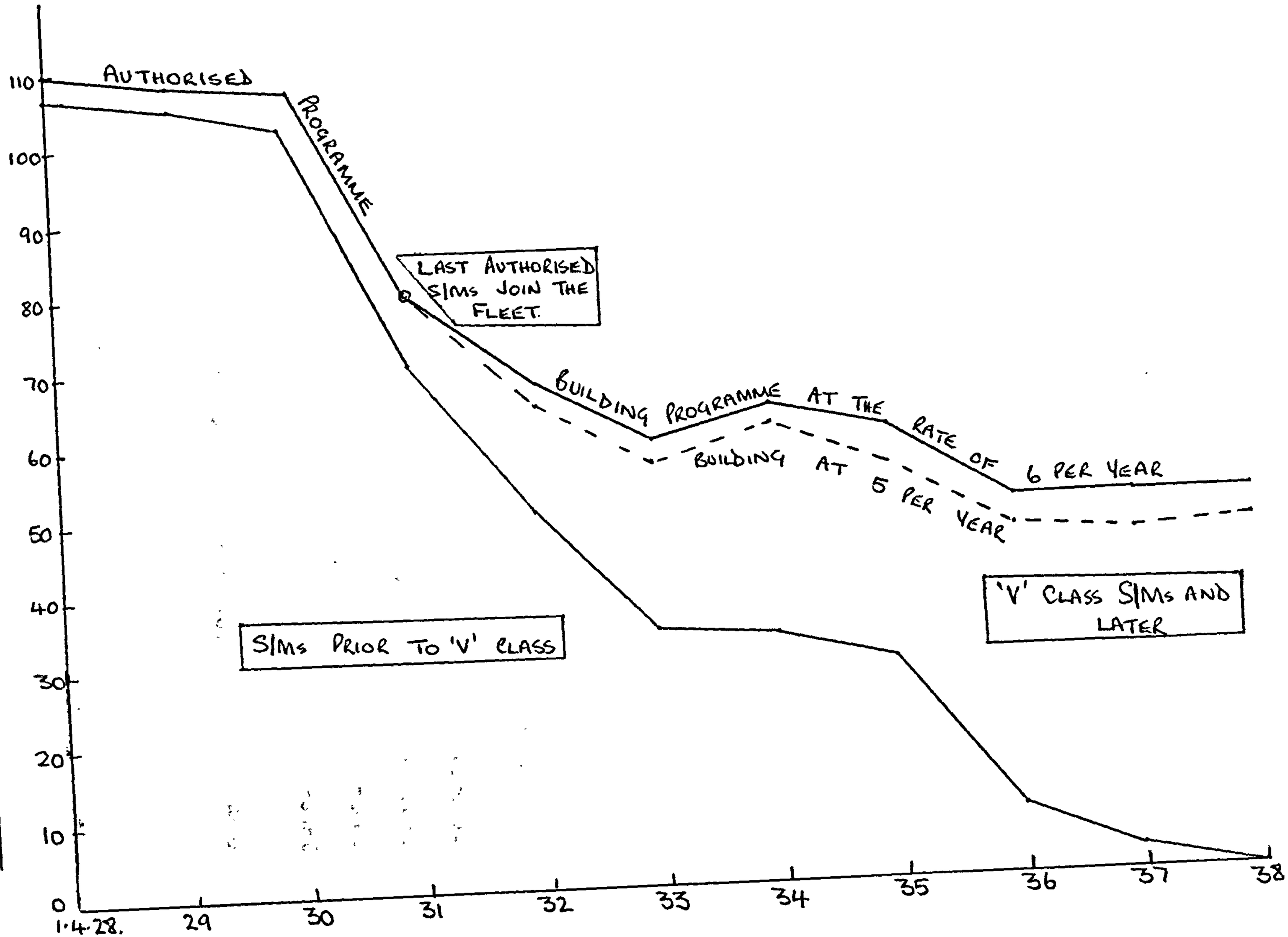


GRAPH B JAPAN

G(6)



GRAPH C U.S.A.



G(6)

G(7)

GOVERNMENT APPROVED SUBMARINE CONSTRUCTION

PROGRAMME UP TO 1930

Year	'O' Class	Fleet Type	Depot Ship
1926-27	6	-	1
1927-28	6	-	-
1928-29	6	-	1
1929-30	5	1	-
TOTAL	23	1	2

G(8)

POSITION OF THE PRINCIPAL NAVAL POWERS ON SUBMARINES OVER 600 TONS STANDARD DISPLACEMENT

BRITISH EMPIRE

(a)	Including 6 'P' class of 1927 Programme		53,576 by 1930
	6 of 1,540 tons (1928)		9,240
(b)		Total	62,816 by 1931
	6 of ? tons (1929)		9,240
(c)		Total	72,056 by 1932

UNITED STATES

(a)			58,588 by 1929
	3 repeat 'V' class		8,466
(b)		Total	67,054 by 1931
	1 'Neff' of ? tons		2,000?
(c)		Total	69,054? by 1932?

JAPAN

(a)			71,577 by 1930
(b)	Believed nil		
	4 boats		
(c)			6,920 approx.
		Total	78,497 by 1932?

FRANCE (Omitting 6 submarines just 12 years old = 4,848 tons)

(a)	and		58,524 by 1930
	(Omitting 12 submarines of 620 tons each)		
	1 boat of 747 tons		747
(b)		Total	59,271 by 1931?
	14 boats of various types		21,379 approx.
(c)		Total	80,650 by 1933?

G(8)

(continued)

ITALY

(a)			25,737 by 1930?
(b)	Believed nil		
	4 boats of 857? tons		5,548
(c)		Total	29,085 by 1931?

The 'standard' displacements of French and Italian submarines were not known and opinion was that they were probably smaller than figures given. The British, American and Japanese figures were as stated at the 1927 Geneva (Coolidge) and Conference.

(a) Denotes tonnage built and building

(b) Denotes tonnage appropriated for but probably not yet commenced

(c) Denotes tonnage projected only and probably not commenced.

G(9)

SUBMARINE FLEETS OF THE 1930 LONDON CONFERENCE POWERS

	Aug. 1914	11 Nov. 1918	Building	Dec. 1929
British Empire	74	137	10	53
U.S.A.	51	77	2	122 (108)
Japan	15	16	7	64
France	54	65	52	59
Italy	19	78	18	39

G(9) SUBMARINE FORCES OF THE BRITISH EMPIRE ON 31 DEC. 1929

Submarines under 13 years of age

Name	Tonnage (Tons of 2,240 lbs.)	Date of Armament	Guns		
			No.	Calibre	
				Inches	Millimetres
H.23	410	1918	-	-	-
H.24			-	-	-
H.27			-	-	-
H.28			-	-	-
H.30			-	-	-
L.3	760		1	4"	102
L.4			1	4"	102
L.5			1	4"	102
L.11			1	4"	102
L.12			1	4"	102
L.14			-	-	-
L.15			1	4"	102
L.16			1	4"	102
L.17			-	-	-
H.31	410	1919	-	-	-
H.32			-	-	-
H.33			-	-	-
H.34			-	-	-
H.43			-	-	-
H.48			-	-	-
H.49			-	-	-
R.4	385		-	-	-
L.18	760		1	4"	102
L.19			1	4"	102
L.20			1	4"	102
L.33			1	4"	102
L.56	845		1	4"	102
H.44	410	1920	-	-	-
H.50			-	-	-
L.21	760		1	4"	102
L.25			-	-	-
L.71	845		1	4"	102
M.2	1,450		1	3"	76
M.3			-	-	-
L.22	760	1921	1	4"	102
L.52	845		2	4"	102
L.69	845	1923	1	4"	102
K.26	1,710		3	4"	102
L.23	760	1924	1	4"	102
L.54	845		1	4"	102
L.53	845	1925	2	4"	102
X.1	2,425		4	5.2"	132

G(9) Submarines under 13 years of age - continued

Name	Tonnage (Tons of 2,240 lbs.)	Date of Armament	Guns		
			No.	Calibre	
				Inches	Milli-metres
L.26	760	1926	1	4"	102
L.27			1	4"	102
Oxley . ..	1,354	1927	1	4"	102
Otway . ..	1,349		1	4"	102
Oberon . ..	1,311		1	4"	102
Odin	1,475	1929	1	4"	102
Otus			1	4"	102
Orpheus ..			1	4"	102
Olympus ..			1	4"	102
Oswald ..			1	4"	102
Osiris ..			1	4"	102

Submarines Building

Parthian ..	1,475	1930	1	4"	102
Perseus ..		1930	1	4.7"	120
Poseidon ..		1930	1	4"	102
Proteus ..		1930	1	4"	102
Pandora ..		1930	1	4"	102
Phoenix ..		1930	1	4"	102
Rainbow ..		1931	1	4.7"	120
Regent ..		1931	1	4.7"	120
Regulus ..		1931	1	4.7"	120
Rover		1931	1	4.7"	120

Submarines Authorised

1 vessel ..	1,760	-	-	-	-
1 vessel ..	640	-	-	-	-
1 vessel ..	640	-	-	-	-

Submarines over 13 years of age - NIL.

G(10)

CLASSES OF SUBMARINES IN ROYAL NAVY 1932

Class and Names of Vessels	Programme Year	Displacement (Tons) Standard	H.P. Surface	Speed (Knots) Surface
'H' Class				
H23-24, 27-34, 43-44, 48-50.	WAR	410	2,400	13
'L' Class				
L.6, 14, 16-23, 25-27.	WAR	760	2,400	17½
'L.50' Class				
L.52-54, 56, 69, 71.	WAR	845	2,400	17½
'R' Class				
R. 4	WAR	585	240	9½
'X.1'	1921-22	2,425	-	19½
'Oberon' Class				
Oberon, Otway, Oxley	1923-24	1511-1554	2950-3000	15-15½
'Odin' Class				
Odin, Otus Osiris, Olympus Oswald, Orpheus	1926	1,475	4,400	17-17½
'Parthian' Class - £445,000 at 1930 prices.				
Parthian, Pandora Perseus, Phoenix Proteus	1927	1,475	4,400	17-17½
'Rainbow' Class				
Rainbow, Regent Regulus, Rover	1928	1,475	4,400	17-17½
'Swordfish' Class - £270,000 at 1930 prices.				
Swordfish	1929	640	1,550	13¾
Sturgeon (Building)	1929	640	1,550	13¾
Starfish (Building)	1930	640	1,550	13¾
Seahorse (Building)	1930	640	1,550	13¾
Sealion (Building)	1931	670	1,550	13¾
Shark (Building)	1931	670	1,550	13¾
Salmon (Building)	1932	640	1,550	13¾
'Thames' Class ('G') - £525,000 at 1930 prices.				
Thames	1929	1,805	10,000	21¾
Severn (Building)	1931	1,805	10,000	21¾
Clyde (Building)	1932	1,805	10,000	21¾
'Porpoise' Class (Minelayer) - £294,000 at 1930 prices.				
Porpoise (Building)	1930	1,500	3,300	15
Grampus (Building)	1932	1,500	3,300	15

G(11)

COMPARISON OF CLASSES AND SUITABILITY OF BRITISH SUBMARINES FOR SERVICE IN FAR EAST

	'L' Class	'Rover' Class	'S' Class	'Thames' Class
Surface Tonnage	760	1475	650	1775
Endurance (Miles)	4,000 at 8 knots	10,000 at 8 knots	5,600 at 10 knots	10,000 at 8 knots
Speed (Surface)	17	18	14 (15.7)	21 (21.7)
W/T Range (Miles)	300	800	450	800-1000
Armament				
Torpedo Tubes	4-21"(Bow)	6-21"(Bow) 2-21"(Stern)	6-21"(Bow)	6-21"(Bow)
Torpedoes	8	14	12	12
Gun	1-4"	1-4"	1-3"	1-4.7"

Habitability

'L' Class: Not good in tropics.

'Rover' Class: Very good and suitable for tropics. Cooling plant is fitted.

'S' Class: Will not be good due to lack of space and not being fitted with cooling plant; are not very suitable for work in the tropics.

'Thames' Class: Good in tropics. Cooling plant fitted but not battery cooling.

G(12)

PROPOSED BRITISH SUBMARINE FLEET 1939

(ON COMPLETION OF CONSTRUCTION PROGRAMMES UP TO 1936)

5	'G' (River) Class	- 1 at 1,805 tons; 2 at 1,850	5,505
6	'Porpoise' Class	- 1 at 1,500; 5 at 1,565	9,525
15	'O', 'P', and 'R' Class	- at 1,475	22,125
5	early 'O' Class	- 1 at 1,511; 1 at 1,549; 1 at 1,554	4,014
15	'S' Class	- 5 at 640; 12 at 670	9,960
42	(27 Large - 15 Small)		50,929*

* 1,771 tons short of London Treaty figure for under-age tonnage and tonnage replacing boats over-age before December 1939. Assuming no further reduction in overall tonnage at proposed 1935 Conference.

PROPOSED BRITISH SUBMARINE FLEET 1945

(ASSUMING ANNUAL RATE OF THREE SUBMARINES LAID DOWN)

	3	'G' Class	5,505
	6	'Porpoise' Class	9,325
+Proposed	20	'P' Type of approximately 1200 tons	24,000
+ "	20	'S' Type of approximately 670 tons	13,400
	49		52,230

+ The numbers of these dependent on the individual tonnage decided on and number of 'S' class found necessary.

G(13)

FORECAST OF THE 1936 - 39 SUBMARINE CONSTRUCTION PROGRAMMES

Year	'T' Class	'Porpoise' Class	'U' Class (Minelayer)
1936	*(1) + 5	1	(2) + 1
1937	5	-	-
1938	2	-	3
1939	2	-	2

* Original Programme in brackets.

APPENDIX H: RESOLUTIONS, DEFINITIONS, AGREEMENTS AND TREATIES

H(1)

ROOT RESOLUTIONS

FINAL TREATY FORM

I

The Signatory Powers desiring to make more effective the rules adopted by civilized nations for the protection of the lives of neutrals and non-combatants at sea in time of war, declare that among those rules the following are to be deemed an established part of international law:

1. A merchant vessel must be ordered to submit to visit and search to determine its character before it can be seized.

A merchant vessel must not be attacked unless it refuses to submit to visit and search after warning, or to proceed as directed after seizure.

A merchant vessel must not be destroyed unless the crew and passengers have been first placed in safety.

2. Belligerent submarines are not under any circumstances exempt from the universal rules above stated; and if a submarine can not capture a merchant vessel in conformity with these rules the existing law of nations requires it to desist from attack and from seizure and to permit the merchant vessel to proceed unmolested.

II

The Signatory Powers invite all other civilized Powers to express their assent to the foregoing statement of established law so that there may be a clear public understanding throughout the world of the standards of conduct by which the public opinion of the world is to pass judgement upon future belligerents.

H(1)

III

The Signatory Powers recognize the practical impossibility of using submarines as commerce destroyers without violating the requirements universally accepted by civilized nations for the protection of the lives of neutrals and non-combatants, and to the end that the prohibition of such use shall be universally accepted as a part of the law of nations they declare their assent to such prohibition and invite all other nations to adhere thereto.

IV

The Signatory Powers, desiring to insure the enforcement of the humane rules declared by them with respect to the prohibition of the use of submarines in warfare, further declare that any person in the service of any of the Powers adopting these rules who shall violate any of the rules thus adopted, whether or not such person is under orders of a governmental superior shall be deemed to have violated the laws of war, and shall be liable to trial and punishment as if on an act of piracy, and may be brought to trial before the civil or military authorities of any such Powers within the jurisdiction of which he may be found.

H(2)

RESOLUTIONS OF 1925 IMPERIAL CONFERENCE

Submarines

1.	Minimum number required for Empire Defence	78
2.	Present strength (planned up to 1926)	55
3.	Vessels building or to be laid down in 1926	10
4.	Strength on 1 April 1930 (Line 2 plus Line 3 minus submarines reaching 12 years age limit.)	57
5.	Numbers of vessels reaching age limit between 1 April 1930 and 1 April 1936	42
6.	Strength on 1 April 1936 allowing for no further building (Line 4 minus Line 5.)	15
7.	Numbers that should be laid down between 1 April 1927 and 1 April 1933 to provide on 1 April 1936 the numbers specified in Line 1. (Line 1 minus Line 6.)	65
8.	Projected British programme from 1 April 1927 to 1 April 1930	18
9.	Deficiency to be made good by additional construction commenced before 1 April 1933 (Line 7 minus Line 8.)	45

H(3)

ADMIRALTY DEFINITION OF MAJOR SUBMARINE TYPES, 1930

1. PATROL SUBMARINE:- Large submarines, of great endurance, for patrol and reconnaissance work at considerable distances from their base. This work may be combined with attack on enemy vessels met with.

2. SMALL-TYPE SUBMARINE:- For use in generally similar ways to the larger patrol type, but at shorter distances from its base; capable, however, of operating in restricted waters, where the larger type would be unsuitable.

3. FLEET SUBMARINE:- Large submarines, of high speed, designed for acting in conjunction with their own fleet in shadowing and attacking the enemy fleet.

4. CRUISER SUBMARINE:- Very large submarines, of specially great endurance, designed primarily for work on the trade routes similarly to surface-cruising vessels.

H(4)

THE LONDON NAVAL TREATY, APRIL 22, 1930

INTERNATIONAL TREATY FOR THE LIMITATION AND REDUCTION OF NAVAL ARMAMENT

PART II

Article 6

1. The rules for determining standard displacement prescribed in Chapter II, Part 4 of the Washington Treaty shall apply to all surface vessels of war of each of the High Contracting Parties.

2. The standard displacement of a submarine is the surface displacement of the vessel complete (exclusive of the water in non-watertight structure) fully manned, engined, and equipped ready for sea, including all armament and ammunition, equipment, outfit, provisions for crew, miscellaneous stores, and implements of every description that are intended to be carried in war, but without fuel, lubricating oil, fresh water or ballast water of any kind on board.

3. Each naval combatant vessel shall be rated at its displacement tonnage when in the standard condition. The word 'ton', except in the expression 'metric tons', shall be understood to be the ton of 2,240 pounds (1,016 kilos).

Article 7

1. No submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inch (130 mm.) calibre shall be acquired by or constructed by or for any of the High Contracting Parties.

2. Each of the High Contracting Parties may, however, retain, build or acquire a maximum number of three submarines of a standard displacement not exceeding 2,800 tons (2,845 metric tons); these submarines may carry guns not above 6.1 inch (155 mm.) calibre. Within this number, France

may retain one unit, already launched, of 2,880 tons (2,926 metric tons), with guns the calibre of which is 8 inches (203 mm.).

3. The High Contracting Parties may retain the submarines which they possessed on the 1st April, 1930, having a standard displacement not in excess of 2,000 tons (2,032 metric tons) and armed with guns above 5.1 inch (130 mm.) calibre.

4. As from the coming into force of the present Treaty in respect of all the High Contracting Parties, no submarine the standard displacement of which exceeds 2,000 tons (2,032 metric tons) or with a gun above 5.1 inch (130 mm.) calibre shall be constructed within the jurisdiction of any of the High Contracting Parties, except as provided in paragraph 2 of this Article.

PART IV

Article 22

The following are accepted as established rules of International Law.

1. In their action with regard to merchant ships, submarines must conform to the rules of International Law to which surface vessels are subject.

2. In particular, except in the case of persistent refusal to stop on being duly summoned, or of active resistance to visit or search, a warship, whether surface vessels or submarine, may not sink or render incapable of navigation a merchant vessel without having first placed passengers, crew and ships papers in a place of safety. For this purpose the ship's boats are not regarded as a place of safety unless the safety of the passengers and crew is assured, in the existing sea and weather

H(4)

conditions, by the proximity of land, or the presence of another vessel which is in a position to take them on board.

The High Contracting Parties invite all other Powers to express their assent to the above rules.

H(5)

BASES OF AGREEMENT

MARCH 1, 1931

PART B VESSELS WHOSE TONNAGE IS REGULATED BY THE TREATY OF LONDON

France and Italy will conform to the following rules in preparing their programmes for construction to be completed before the 31st December, 1936:-

(c) Submarines

No further construction other than for completion of the 1930 programme and for the replacement of tonnage becoming over-age after the 31st December 1931. Over-age vessels shall be scrapped, except where scrapping would result in the total submarine tonnage figure falling below the submarine figure mentioned in article 16 of the Treaty of London.

Subject to a general revision of the naval question in the course of the Disarmament Conference of 1932, the tonnage of French submarines in commission will not exceed, up to the 31st December, 1936, the figure of 81,989 tons, representing at the present moment the under-age tonnage of vessels built or building. The Members of the British Commonwealth of Nations maintain that this figure of 81,989 tons is too high in relation to their destroyer tonnage of 150,000 tons under the London Naval Treaty, but they agree to notify the other signatories of Part III of the Treaty of London that they will not have recourse to article 21 of the London Treaty pending the general revision of the naval question mentioned above. Should it not be possible at the 1932 conference to arrive at a satisfactory equilibrium between French submarine tonnage and British Commonwealth destroyer tonnage, the Members of the British Commonwealth of Nations will retain their right to make such an increase as they may judge necessary in their destroyer figure of 150,000 tons.

APPENDIX I: BRITISH SUBMARINE DISPOSITIONS 1938 - 1939

I(1) PROPOSED BRITISH SUBMARINE DISPOSITIONS

JULY 1939

Base	No. of Boats	Class
Portland & Portsmouth	14	9 'H'
		5 'L'
		2 'O'
Blyth	9	6 'S'
		3 'O'
Middlesborough	9	6 'S'
		3 'U'
Rosyth (Port Edgar)	14	3 'River'
		8 'T'
		3 'Porpoise'

(Four 'T' Class due for completion in July 1939)

Rear-Admiral (S) Raikes to Admiral Backhouse, 23 Feb. 1938, 'Review of the factors affecting the employment and disposition of submarines in a War with Germany.'

Revised List

Bases	No. of Boats	Class
Portland	14	
Blyth	14	
Middlesborough	9	
Hartlepool	20	8 'T'
		12 'S'

I(2)

WAR MEMORANDUM

REAR ADMIRAL(S) No. 05 18 AUG. 1938

ENCLOSURE No. 2

PATROL SUBMARINES LIKELY TO BE AVAILABLE FOR OPERATIONS AND TRAINING IN HOME WATERS DURING THE PERIOD AUGUST 1938 TO JUNE 1959

Submarines Available For War Duties		Submarines Available For Training
	AUGUST 1938	
6 'S', 3 'L', 5 'H'	TOTAL 14	5 'O', 3 'H'
	SEPTEMBER 1938	
6 'S', 3 'L', 5 'O', 1 'U'	TOTAL 15	8 'H'
	OCTOBER 1938	
6 'S', 3 'L', 5 'O', 1 'U'	TOTAL 15	8 'H'
	NOVEMBER 1938	
6 'S', 3 'L', 5 'O', 2 'U', 1 'T'	TOTAL 17	8 'H'
	DECEMBER 1938	
6 'S', 3 'L', 5 'O', 3 'U', 1 'T'	TOTAL 18	8 'H'
	JANUARY 1939	
6 'S', 3 'L', 5 'O', 3 'U', 1 'T'	TOTAL 18	8 'H'
	FEBRUARY 1939	
6 'S', 3 'L', 5 'O', 3 'U', 2 'T'	TOTAL 19	8 'H'
	MARCH 1939	
6 'S', 3 'L', 5 'O', 3 'U', 5 'T'	TOTAL 22	8 'H'
	APRIL 1939	
6 'S', 3 'L', 5 'O', 3 'U', 7 'T'	TOTAL 24	8 'H'
	MAY 1939	
6 'S', 3 'L', 5 'O', 3 'U', 7 'T'	TOTAL 24	8 'H'
	JUNE 1939	
6 'S', 3 'L', 5 'O', 3 'U', 8 'T'	TOTAL 25	8 'H'

I(2)

SUBMARINES HOMEWATERS - DISPOSITIONS AUG. 1938 - SEPT. 1939

WAR ORGANISATION AND DISPOSITIONS OF SUBMARINES

	Aug. 1938	11 Sept. 1938	25 Sept. 1938	Feb. 1939	Mar. 1939
2nd S.F.	-	5'O'		2'O'	2'O'
Under R.A.(S) who in turn under CinC Home Fleets	3'S' 2'Porpoise'	8'S' - 1'H'	8'S' - 4'H'	7'S' - 1'U'	8'S' 3'Porpoise' -
TOTAL	5	14	12	10	13
3rd S.F.		2'Porpoise'	2'Porpoise'		
Amalgamated with 6th S.F. under Feb. 39 reorganisation		3'L'	3'L' 2'H'		
TOTAL		5	7		
6th S.F.	Mines for S/M Minelayers to be kept at Blyth and boats to call there prior to patrol.			3'Porpoise' 3'L' 1'H'	3'U' 3'L'
(Blyth) Details as for 2nd S.F.					
TOTAL				7	6
5th S.F.	3'S' 2'L'	8'H'	3'H' 1'U' 1'Porpoise'	2'H' 2'U' 1'T'	2'H' 2'U' 1'T'
Training Command by Captain 5th S.F. Admin. by R.A.(S) (Portsmouth and Portland)			5'O' +N.C.	3'O' +N.C.	3'O' +N.C.
TOTAL	5	8	10+	8+	8+
RESERVE	3'H' 5'O'			6'H'	6'H'
TOTAL	8			6	6
GRAND TOTAL	25	27	29	31	33

S.F.: Submarine Flotilla

N.C.: New Construction

I(2)

SUBMARINE DISPOSITIONS AUG. 1938 - SEPT. 1939

HOME WATERS AND MEDITERRANEAN

	April 1939	July 1939	August 1939
1st S.F.		3 'Porpoise'	3 'Porpoise'
Under Command C. in C. Mediterranean.		6 'S' (2 from 2nd SF) 4 'T' (3 from 2nd S.F.)	4 'S' 3 'O'
Total		8 + 5	10
Atlantic S.F.			2 'River' Temporarily under R.A. Gibraltar
Total			2
2nd S.F.	2 'O'(Reserve)	2 'O'(Reserve)	2 'O'
(Dundee) R.A.(S) under C. in C. Home Fleets.	7 'S' 3 'Porpoise'	7 'S' + 1 'S' in Sept. 1 'River' 1 'T' + 2 'T' in Aug. & Sep.	7 'S' 1 'River' 1 'T'
Total	12	14	11
6th S.F.	3 'U'	3 'U'	3 'U'
(as above)	3 'L' (or 2 'L' + 1 'H')	3 'L'	3 'L'
Total	6	6	6
5th S.F.	8 'H' (6 in Reserve)	9 'H'(Reserve)	9 'H'
(Training) Portsmouth and Portland	4 'O'(Reserve then to 1st SF) 2 'T' (until service) 2 'S' (") + N.C.	+ N.C.	1 'S' (to 2nd SF) 2 'T'
Total	16+	9+	12
GRAND TOTAL	34	37	39

I(2)

SUBMARINE DISPOSITIONS IN HOME WATERS, MEDITERRANEAN AND FAR EAST - SEPTEMBER 1939

1st S.F. (Malta)	Depot Ship - 'MAIDSTONE'	3 'Porpoise' 4 'S' 3 'O'	Under Command of C. in C. Mediterranean.
Total		10	
2nd S.F. (Dundee)	Depot Ship - 'FORTH'	3 'T' 1 'O' 7 'S' + 1 'S' (Oct. 1939)	Under R.A.(S) and in turn under C. in C. Home Fleets.
Total		12	
4th S.F. (China)	Depot Ship - 'MEDWAY'	4 'O' 5 'P' 4 'R' 2 'Porpoise'	Under Command of C. in C. China Station.
Total		15	
6th S.F. (Blyth)	Depot Ship - 'TITANIA'	3 'U' 2 'L' + 1 'H'	(as 2nd S.F.)
Total		6	
5th S.F. (Training) Portsmouth and Portland	Depot Ship - 'ALECTO'	7 'H' + 2 'H' (Refitting) 1 'River' 1 'O'	Commanded by Capt. (S) 5th S.F. Admin. by R.A.(S).
Total		11	
GIBRALTAR		2 'River'	(on passage to Freetown)
ADEN		1 'Porpoise'	(detached from China Station)
Total		3	
GRAND TOTAL		57	

APPENDIX J: BIBLIOGRAPHY

INTRODUCTORY NOTE

Admiralty Papers (ADM)

ADM:1 and ADM:116:- These registered files of the Admiralty Secretary's Department contain the bulk of material on British submarine policy and development. ADM:116 'cases' are collections of documents on specific subjects.

ADM:138:- Ships Covers; housed at the National Maritime Museum, Greenwich. They contain useful additional material on submarine development.

ADM:167:- Files containing the Minutes and Memoranda of the meetings of the Board of Admiralty.

ADM:186:- Technical information on development of submarine weaponry and tactics, principally asdic, torpedoes and gunnery. In addition there are reports on Exercises and A/S training.

Cabinet Papers (CAB)

CAB:2, 3, 4, 16, 19:- Contain papers of the Committee of Imperial Defence with relevance to naval policy, some of which contain material not within the Admiralty files.

CAB:21, 27:- Several files on miscellaneous aspects of naval policy all with some connection to submarine policy or construction.

CAB:29:- These files contain material on the London Naval Conferences, much of which is duplication of the information contained in the ADM:1 and ADM:116 series. However, there is a limited amount of additional material.

CAB:30:- Papers on the 1922 Washington Conference. Once again duplication with the ADM:1 and ADM:116 series but also some unique material.

CAB:33, 53, 55:- General naval policy during 1930's.

H.M.S. 'Dolphin' Archives, Gosport

Extensive collection of miscellaneous papers on the Submarine Service and submarine development, in various stages of being re-catalogued. Therefore the numbers listed may have been altered as the documents were examined by the Curator and his staff. Useful material on submarine trials, tactics, design modifications, scrapping and construction programmes, weapons development, asdic, as well as quarterly and half-yearly Reports.

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